

NOTES ON ORTHOPTERA FROM SOUTHERN ARIZONA, WITH DESCRIPTIONS  
OF NEW SPECIES.

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To better present the results of the study of a considerable amount of material from southern Arizona, it has appeared advisable to divide this paper into three parts, each of which treats of a different locality or set of localities.

These three are: first, Cochise County localities; second, Pima County localities; third, Phoenix, Maricopa County.

The total number of specimens treated in the three sections is 842, the species numbering 116, of which 11 are new, 7 are new records for the United States and 19 are here credited to Arizona for the first time.

I. COCHISE COUNTY.

The specimens on which the following study is based are chiefly contained in four collections made during the year 1905 by as many field collectors. The two largest and in many respects the most important ones were made in Carr Canyon, Huachuca Mountains, one in August by Dr. Henry Skinner and now forming part of the Academy collection, the other made in September and October by Mr. C. R. Biederman and now being the property of Mr. Morgan Hebard, of Chestnut Hill, Philadelphia. The third collection was made in the same range of mountains as the two mentioned above, but at Palmerlee, and was due to the work of Mr. Charles Schaeffer, of the Brooklyn Institute of Arts and Sciences, to whose collection this series belongs. The fourth lot was in some respects the most interesting as far as range extension of species is concerned, and was made at San Bernardino Ranch, 3,750 feet elevation, by Prof. F. H. Snow, of the University of Kansas, to the collection of which institution the specimens belong.

A number of specimens from Douglas have been examined, and a few labelled simply "Huachuca Mts." are also mentioned herein.

The number of species here treated is 90, of which 8 are new, 5 previously known forms are here recorded from the United States for the first, and 16 are recorded the first time from Arizona. The number of specimens examined was 526, of which 407 belonged to the Acrididæ.

The author wishes to thank Mr. Hebard, Mr. Schaeffer and Prof.

Snow for the opportunity to examine the material from the collections mentioned above.

#### FORFICULIDÆ.

##### SPONGIPHORA Serville.

*Spongiphora apicidentata* Caudell.

Huachuca Mountains, August 22 (Schaeffer), 1 ♀.

This is the species recorded from Florence, Pinal Co., Arizona, as *Labia melancholica*,<sup>1</sup> and two ♂ and one ♀ from Riverside, Riverside Co., California, have also been seen. Of the ten specimens here examined but two, the Huachuca specimen and one from Florence, have the yellowish spot on the exposed portion of the wings strongly marked.

##### APTERYGIDA Westwood.

*Apterygida linearis* (Esch.).

Douglas, August (F. H. Snow), 1 ♀.

#### BLATTIDÆ.

##### ISCHNOPTERA Burmeister.

*Ischnoptera uhleriana* Saussure.

Palmerlee (Schaeffer), 1 ♀.

This specimen agrees very well with Saussure and Zehntner's description of the female of this species, but it is clearly separable from *Temnopteryx virginica* Brunner, which has been considered the female of this species. The tegmina are longer and rounded as in the female of *Ischnoptera pennsylvanica*, the latter being *Phyllodromia borealis* of authors, and not truncate as in "*Temnopteryx virginica*." In general the specimen in hand resembles what I have considered the female of *couloniana*, but is smaller, with a comparatively greater space between the eyes, and with the supra-anal plate of a different shape, being more transverse and less produced. This specimen is clearly what Saussure and Zehntner called the female of *uhleriana*, and this seems to raise a question as to whether *Ischnoptera uhleriana* and *unicolor* might not be separable in the female sex, with very similar males. Male individuals of *uhleriana* have been recorded by Caudell from the Huachuca Mountains and the Patagonia and Santa Rita Mountains, south-eastern Arizona.

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<sup>1</sup> *Proc. Acad. Nat. Sci. Phila.*, 1904, p. 562.

**BLATTELLA** Caudell.*Blattella dilatata* Saussure.

Palmerlee (Schaeffer), 1 ♀. Huachuca Mountains (Schaeffer), July 8, 1 ♂.

The female specimen agrees very well with the description of this species, which has been recorded only from Orizaba, Mexico. The male, which has never been described, resembles *Blattella adspersicolis*, having the slight maculations of the pronotum very similar, but is slenderer with the pronotum more trigonal, the margins of the same more deflected and the tegmina shorter and broader. The measurements of the pair are as follows:

	♂	♀
Length of body, . . . . .	12. mm.	13.5 mm.
Length of pronotum, . . . . .	3.5 "	3.9 "
Greatest width of pronotum, . . . . .	4.6 "	5.5 "
Length of tegmen, . . . . .	14 "	8.5 "
Greatest width of tegmen, . . . . .	4 "	3.8 "

In the female specimen the tegmina do not reach to the apex of the abdomen, which they exceeded in the type, but the form of supra-anal plate and other characters are very similar to those mentioned by Saussure.

**MANTIDÆ.****YERSINIA** Saussure.*Yersinia solitaria* Scudder.

Carr Canyon, Huachuca Mountains, August (Skinner), 2 ♂. September and October (Beiderman), 3 ♀.

All of these specimens are larger than a female from Gallinas Canyon, New Mexico, and no traces of organs of flight are present. A very curious feature about this species is the distinct proximal inflation of the caudal femora, probably a sign of considerable saltatorial ability.

**LITANEUTRIA** Saussure.*Litaneutria skinneri* n. sp.

Types: ♂ and ♀; Carr Canyon, Huachuca Mountains, Cochise Co., Arizona. August, 1905 (H. Skinner). [A. N. S. Phila.]

Differing from the known members of the genus in having the tegmina and wings of the male short as in the known females of the genus.

Size about the average for the genus. Head distinctly trigonal when viewed cephalad, dorsal outline straight in the male, slightly areuate in the female; facial scutellum transverse, slightly arched in the male, oblong

in the female; eyes moderately prominent, slightly elevated above the dorsal outline of the head in the male, in a general way continuing the dorsal arcuation in the female; antennæ short, hardly exceeding the head and pronotum in the female. Pronotum with the greatest width contained about two and a fourth times in the length, the dilation considerable, the cephalic section of the pronotum hardly constricted and evenly rounded, the caudal section considerably but not greatly constricted, caudal margin arcuate; median carina distinct on the shaft of the pronotum, represented by a slight longitudinal sulcus on the cephalic section; lateral margins practically unarmed in the male, crenulato-dentate in the female. Tegmina very slightly longer than the pronotum in both sexes, elongate-ovate in shape, stigma present at about a third the distance from the apical margin, the apex rotundato-truncate, veins distinct. Wings slightly projecting beyond the apices of the tegmina. Abdomen with a distinct longitudinal carina extending the whole length and more distinct in the female than in the male; supra-anal plate of the male with the apex subtruncate and the width of the same about equal to the length, subgenital plate with two very short apical styles, cerci exceeding the supra-anal plate and reaching the tip of the subgenital; supra-anal plate of the female similar to that of the male in shape but more pro-

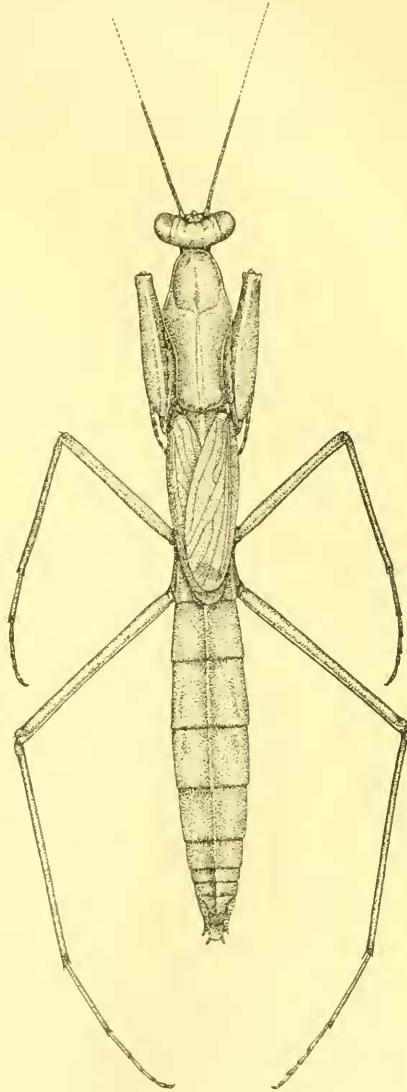


Fig. 1.—*Litaneutria skinneri* n. sp. Dorsal view of male type. ( $\times 4$ .)



duced, the subgenital plate with the apical cleft not quite reaching to the middle of the plate, cerci as long as the supra-anal plate. Cephalic coxæ slightly shorter than the pronotum in both sexes; femora about equal to the pronotum in length, particularly robust in the female, caudal margin with five, cephalic with ten to eleven spines in both sexes, largest discoidal spine rather heavy; cephalic tibiæ not quite two-thirds the length of the femora, margins with nine to ten spines; tarsi with the proximal joint about equal to the tibia in length. Median and caudal limbs rather slender.

General color of the male buff with a wash of clay color on the abdomen and the head with russet; of the female clove brown, the median carina of the pronotum and maculations and imperfect annulations on the limbs pale ceru drab. Tegmina in both sexes with their ventral surface near the distal margin with a transverse blackish maculation. Face with an obscure transverse blackish median bar in the female.

*Measurements.*

	♂	♀
Length of body, . . . . .	22 mm.	26.2 mm.
Length of pronotum, . . . . .	5 "	6.5 "
Greatest width of pronotum, . . . . .	2.2 "	3.2 "
Length of tegmen, . . . . .	5.5 "	7 "
Length of cephalic femur, . . . . .	4.5 "	6 "

In addition to the types a paratype series of one male, three females and one immature individual have also been examined. The second male agrees fully with the type in the shape and structure of the tegmina, and the females differ only in the depth of the general coloration.

I take pleasure in dedicating this species to its collector, whose kindly advice and sympathetic interest has been of the greatest assistance to the author.

**STAGMOMANTIS** Saussure.

*Stagmomantis limbata* (Hahn).

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 2 ♂, 1 ♀. Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♂, 9 ♀, 3 immature individuals. September and October, 1905 (Biederman), 5 ♂, 1 ♀.

These specimens are typical with the exception of the female from San Bernardino Ranch, which has the general appearance, size and form of pronotum of *limbata*, but has the costal area of the tegmen

very narrow, comparatively narrower even than in *carolina*. This individual is so clearly typical of *limbata* in every respect, except the width and form of the costal area, the only thing to consider it is an abnormality of this species. The width of the costal area is less than a fifth that of the tegmen. Four of the male specimens are in the green phase and five in the brown, one, however, not as completely brown as the others; seven of the females are green and four brown, one of the latter being rather pinkish.

#### BACTROMANTIS Scudder.

##### *Bactromantis virga* Scudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♀.  
Huachuca Mountains (Schaeffer), 1 ♂.

These two specimens measure as follows:

	♂	♀
Length of body, . . . . .	39.2 mm.	49 mm.
Length of pronotum, . . . . .	10 "	14 "
Length of tegmen, . . . . .	24 "	"
Length of cephalic femur, . . . . .	8.5 "	11 "

Whether these specimens are identical with the typical Florida *virga* can only be determined by comparison with authentic or topotypic material, as the original description is very brief and unsatisfactory.

Caudell has recorded this species from the Huachuclas, Nogales and Phoenix, Arizona, as well as Brownsville, Texas.

#### PHASMIDÆ.

##### PSEUDOSERMYLE Caudell.

##### *Pseudosermyle truncata* Caudell.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂.  
Huachuca Mountains, July (Schaeffer), 1 ♂, 1 ♀. San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♀.

The Huachuca female agrees very well in size with the measurements of the type, and has the basal abdominal segments with prominent tubercles as in the Bright Angel female mentioned by the describer. The San Bernardino Ranch female is slightly smaller than the other, smoother, and has the carinæ and lobes similar in disposition but lower and weaker. The male specimens are larger than those mentioned in the original description, being approximately 47 and more millimeters in the length of the body.

When compared with the Mexican *P. tridens* (Burmeister), the apex of the male abdomen is seen to be distinctly less inflated with a trigonal

disposition of the cercal teeth instead of a digitiform arrangement as in *tridens*, in addition to which the size is slightly less. The females of the two species are very similar, but *truncata* has the limbs longer and the carinae of the abdomen more distinct.

This species has previously been recorded from Dos Cabezos, Cochise Co. (type locality), and Bright Angel, Coconino Co., Arizona, as well as Los Angeles Co., California.

#### DIAPHEROMERA Gray.

##### *Diapheromera arizonensis* Caudell.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂.

This specimen has fully retained its natural coloration, which appears worthy of description.

General color cadmium yellow, a broad dorsal line covering practically all of the metanotum and all of the mesonotum except the caudal seventh parrot green, the abdomen with the proximal half of all segments except the distal one green, ranging from parrot green on the proximal four to oil green on the others; terminal segment and cerci tawny ochraceous. Pronotum with a slight median touch of greenish. Head with a slight clay-colored bar caudad of the eyes; antennae vinaceous-rufous. Venter of the mesothorax and metathorax marked with green as on the dorsum, and bearing a fine median longitudinal line of blackish coextensive longitudinally with the green. Limbs with each joint greenish (apple green) proximad, chrome yellow distad, tarsi raw sienna, femoral spines blackish-brown.

The Mexican *D. calcarata* is closely related to this form, but differs in the much more swollen median and caudal femora of the male.

This species has previously been recorded only from the type locality, Hot Springs, Yavapai Co., Arizona.

#### PARABACILLUS Caudell.

##### *Parabacillus coloradus* (Seudder).

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♀. September and October, 1905 (Biederman), 1 ♂, 1 ♀. Huachuca Mountains (Schaeffer), 1 ♂.

The male has a distinct dorsal longitudinal stripe of brownish on a light yellow ground.

The Mexican *P. palmeri* (Caudell) is extremely close to this species.

#### ACRIDIDÆ.

##### PARATETTIX Bolivar.

##### *Paratettix toltecus* (Saussure).

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♀. Huachuca Mountains (Schaeffer), 2 ♂, 2 ♀.

These specimens fully agree with New Mexican and Mexican individuals of this species. One female belongs to the long-winged form *P. toltecus extensus* Morse.

*Paratettix mexicanus* (Saussure).

Huachuca Mountains (Schaeffer), 1 ♂.

**ACHURUM** Saussure.

*Achurum acridodes* (Stål).

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂.  
Palmerlee, August (Schaeffer), 1 ♀.

After comparison of these specimens with two females of true *A. sumichrasti* from Guadalajara, Jalisco, Mexico, the conclusion is reached that two species are represented. The Arizona specimens differ from the Jalisco individuals in the head being somewhat less elongate, with the eye somewhat shorter and the antennæ distinctly shorter and slenderer. The pronotum also is not so elongate and the lateral lobes are distinctly shorter than in *sumichrasti*, while the lobes of the genicular region of the caudal femora are distinctly less elongate and stouter, the length of the principal genicular lobes in *sumichrasti* being equal to that of the genicular arch, while in the Arizona specimens it is distinctly less. The dorsum of the pronotum is obscurely punctate on the cephalic portion of the prozona and all of the metazona in *acridodes* and lineato-rugose on the same areas in *sumichrasti*. On the basis of this character of the pronotum the name *acridodes* has been applied to this form, as Stål states in his description in the *Reconsilio Orthopterorum*,<sup>2</sup> in comparing with *sumichrasti*, "pronotoque dorso haud alutaceo-rugoso, sed antice et in lobo postico obsolete punctulato."

Burr in his key to the species of the genus<sup>3</sup> appears to have misinterpreted Stål's remarks on the length of the tegmina, as the former says: "Elytra abdomen haud superantia," while Stål's words are: "Elytra corpore paullo breviora, femoribus posticis plus duplo longiora." It seems evident that Stål intended to mean the entire length of the body rather than the apex of the abdomen, as in the latter case the tegmina would have been very little longer than the caudal femora, considering of course the slender femora present in this genus.

**MERMIRIA** Stål.

*Mermiria bivittata* (Serville).

Douglas, August (F. H. Snow), 1 ♂, 1 ♀.

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<sup>2</sup> I, p. 101.

<sup>3</sup> *Trans. Ent. Soc. London*, 1902, p. 178.

Rather larger than Nebraska, Colorado, Utah and New Mexico individuals, but otherwise inseparable. The male has the base color greenish, the female reddish ash.

*Mermiria texana* Bruner.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 3 ♀.

These specimens are quite typical of this richly colored species which has previously been recorded from Fort Grant, Arizona.

#### SYRBULA Stål.

*Syrbula admirabilis* (Uhler).

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂, 1 ♀.

The female specimen has the pronotum slenderer than is the case in seventeen female specimens from east of the Rocky Mountains. It is possible that the specimens from Arizona represent Stål's *S. leucocerca*, which is clearly either *admirabilis* or a closely allied form, but this matter involves the examination of Stål's type.

*Syrbula fuscovittata* Thomas.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 10 ♂, 10 ♀, 1 immature individual. September and October, 1905 (Biederman), 5 ♂, 1 ♀. Huachuca Mountains, July 13 (Schaeffer), 1 ♂. Palmerlee, August (Schaeffer), 1 ♀. Douglas, August (F. H. Snow), 1 ♂, 1 ♀. San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♀.

This very interesting series shows that both sexes exhibit considerable color variation, in the male being chiefly due to either the greenish or grayish tone of the lighter areas, the general clove brown or blackish color remaining much the same, while in the female variation is due to the presence of two phases with different base colors. The greenish phase has light green by far the predominating color, while the brown phase ranges from warm browns to a decided umber, the dorsum of the tegmina being ashy gray in several individuals. One female specimen has the tegmina and limbs colored as in the green phase, while the pronotum and head show practically no greenish, being nearly as in the brown phase. The single male labelled Huachuca Mountains is extremely interesting as it appears to represent the freshly emerged condition, as the date (July) would also testify. This specimen is somewhat shrivelled, as would be expected in the drying of soft chitin, and in color is quite striking, the insect being generally pea green, the dorsum of the pronotum buff, the eyes and distal portion of the antennae walnut brown the tegmina whitish hyaline and the wings distinctly infusate.

This species has been recorded from several localities in southern Arizona.

**ACROCARA** Scudder.

*Acrocara maculipenne* Scudder.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂.

This specimen is perfectly typical of this scarce species except that the pale colors are bone white, the darker colors more sombre brown and the proximal portion of the wings, the metanotum and dorsal section of the proximal abdominal segments sevrés blue instead of bronze green. Such differences as exist are merely in color shades, the maculation and pattern of lines and bars being the same as described by Scudder. This species has only been recorded from Montelovez, Coahuila, and Villa Lerdo, Durango, Mexico, the above record constituting the first from within the limits of the United States.

**ERITETTIX** Brunner.

*Eritettix variabilis* Bruner.

Douglas, August (F. H. Snow), 1 ♀.

This specimen has little or no trace of the supplementary carinæ on the dorsum of the pronotum, but the antennæ are typical of the species. There appears to be no doubt that *Eupedetes carinatus* Scudder is no other than this species, as a study of the description will show. The character of the antennæ does not appear sufficient to form the basis of a new genus, especially in view of the appreciable reduction of the clavation in species like *tricarinatus* and *navicula*. Another point apparently overlooked by Scudder in describing *Eupedetes* is that *Eritettix*<sup>4</sup> was based on but two definitely stated species, *variabilis* and *abortivus*, although *carinatus*, *tricarinatus* and *virgatus* were mentioned through the generic description in explanation of variable characters. Of these two definitely placed species *variabilis* stands first, and is the type also by elimination as *abortivus* was removed by Scudder to *Mesochloa* in 1898. It is thus evident that the type of *Eritettix* is a species with non-clavate antennæ.

This species has previously been recorded only from Silver City, Grant Co., New Mexico, and, as *Eupedetes carinatus*, from La Trementina, San Miguel Co., New Mexico.

**AMPHITORNUS** McNeill.

*Amphitornus ornatus* McNeill.

Carr Canyon, Huachuca Mountains, 5,500 feet, September, 1905 (Biederman), 2 ♀.

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<sup>4</sup> *Proc. U. S. Nat. Mus.*, XII, p. 56.



One of the specimens examined has the brown shades much darker than the other, and the femoral maculations more distinct in consequence.

The greater angle of the face appears to be the most satisfactory structural character to separate this species from the allied *A. coloradus*.

**OPEIA** McNeill.

**Opeia testacea** Scudder.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂, 1 ♀.

This species has previously been recorded from a number of localities in southern California, but not from Arizona.

**ORPHULELLA** Giglio-Tos.

**Orphulella compta** Scudder.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 2 ♂, 3 ♀.

The two males are dull brown in color, one female ochraceous, another very dark brown and the third in the green phase. In measurements they agree closely with the types.

**BOÖPEDON** Thomas.

**Boöpedon fuscum** Bruner.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂.

This specimen is typical of this form, which appears to be doubtfully separable from *nubilum* (Say). The only differential character which appears constant when compared with three males of *nubilum* from Nebraska and Colorado is the absence of a pale pregenicular annulus on the caudal femora, as the color of the caudal tibiae is uniform blackish in a Pueblo, Colorado male, and the number of spines on the outer tibial margin is twelve in the San Bernardino specimen and ranges from eleven to thirteen in the males of *nubilum*. This species was described from Nogales and Phoenix, Arizona, and specimens from Casas Grandes, Chihuahua, Mexico, recorded by the author as *B. nubilum*,<sup>5</sup> should be referred to this form, although one possesses very faint traces of pregenicular annuli.

**SCYLLINA** Stål.

**Scyllina calida** (Bruner).

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♀.

This specimen clearly represents the form of the genus found in Morelos, Guerrero, Michoacan and Jalisco, Mexico. It is not closely related to *S. patriæ* (Scudder), supposed to be from California, which

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<sup>5</sup> *Proc. Acad. Nat. Sci. Phila.*, 1904, p. 519.

has among other differential characters luteous caudal tibiae instead of the parti-colored type found in most of the Mexican and Central American members of the genus. This is the first record of the species from north of Guadalajara, and in consequence the first record from within the United States.

**PSOLOESSA** Seudder.

***Psoloessa maculipennis*** Seudder.

Palmerlee, August 7 (Schaeffer), 2 ♀.

These specimens are inseparable from New Mexican individuals.

***Psoloessa buddiana*** Bruner.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂, 1 ♀.

This species has been recorded from southern Arizona, Dimmit Co., Texas, and Montelovez, Coahuila, Mexico.

**AGENEOTETTIX** McNeill.

***Ageneotettix australis*** Bruner.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♀. September, 1905 (Biederman), 1 ♀. Palmerlee, August (Schaeffer), 1 ♀.

The only previous record of this species is that of the types—Phoenix, Arizona.

**AULOCARA** Seudder.

***Aulocara femoratum*** Seudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂, 4 ♀. September, 1905 (Biederman), 4 ♂.

The lateral lobes of the pronotum are usually less strongly marked in these individuals than in Colorado, Nebraska and Wyoming specimens.

This species has been recorded from Phoenix, Arizona, by Bruner.

***Aulocara rufum*** Seudder.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂, 1 ♀.

These individuals are inseparable from Colorado and Nebraska specimens. The caudal margin of the pronotum is strongly marked with dark maroon and the general color is vinaceous pink.

This species has been recorded by Seudder and Cockerell from La Cueva, Organ Mountains, southern New Mexico.

**ARPHIA** Stål.

***Arphia crassa*** Bruner.

Carr Canyon, Huachuca Mountains, August (Skinner), 1 ♂, 4 nymphs. September 23 and 27, October 16 and 20, 1905 (Biederman), 7 ♂, 12 ♀.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂.

Aside from the larger general size and broader fuscous are of the wing this species is very closely allied to *A. pseudonietana*. A number of specimens have the dorsum of the pronotum clay color, while others are strongly marked with a "pepper and salt" color pattern.

***Arphia aberrans* Bruner.**

Carr Canyon, Huachuca Mountains, August (Skinner), 1 ♂, 2 ♀. Palmerlee, July 27, 1905 (Schaeffer), 2 ♀.

These specimens agree very well with the description and measurements of this species, the dorsal (caudal) edge of the tegmen, however, being decidedly pale and unicolorous in all but one specimen. The individuals possessing the pale edging show such variation in the shade of the same that it is, no doubt, subject to considerable variation. The contrast between the bluish distal two-thirds of the tibiae and the pale ferruginous tarsi is quite striking.

**ENCOPTOLOPHUS** Scudder.

***Encoptolophus texensis* Bruner.**

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂.

Individuals from Florence, Arizona, previously recorded by the author as *E. subgracilis* Caudell,<sup>6</sup> are referable to this species.

**HIPPISCUS** Saussure.

***Hippiscus corallipes* (Haldeman).**

Douglas, August (F. H. Snow), 1 ♀. San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂. Palmerlee, July 23 (Schaeffer), 1 ♀. Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♀.

Several of these specimens are what is usually called *zapotecus*, as they possess red internal faces to the caudal femora. However, there appears no reason why this type is not true *corallipes* as Haldeman's original description says: "Inside of the posterior femora, tibiae and tarsi bright vermilion, a paler tint extending to the outside of the tarsi and half of the tibiae." This is exactly what we find in specimens now referred to *zapotecus*, and such a description cannot well be considered that of a form with the proximal two-thirds of the internal faces of the caudal femora dark blue. Caudell<sup>7</sup> has called attention to this fact and the author wishes to add that representatives of the two forms have been taken at the same locality on the same day, as demonstrated by material in the collection of the Academy.

<sup>6</sup> *Proc. Acad. Nat. Sci. Phila.*, 1904, p. 566.

<sup>7</sup> *Proc. U. S. Nat. Mus.*, XXVIII, p. 468.

The female representative from Douglas has the pronotum rather slenderer than the other specimens, and in this respect superficially resembles *H. pardalinus*, from which, however, it is quite distinct.

**LEPRUS** Saussure.

**Leprus elephas** Saussure.

Carr Canyon, Huachuca Mountains, September 26 and October 20, 1905 (Biederman), 2 ♂, 1 ♀.

These specimens are unquestionably *elephas*, but in none are the wings clear yellow on the disk as usual in this species. All have that area bluish or green, in one decidedly blue proximad, in another with all except the proximal section strongly inclined toward yellow. The subequal lateral lobes of the pronotum will readily separate this form from the species with pronounced blue wings, all of the latter type having the ventral width of the lobes greater than the dorsal, owing to the rounded extension of the ventro-caudal margin.

**Leprus glaucipennis** Scudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♂, 2 ♀. September 27 and October 16, 1905 (Biederman), 2 ♀.

This series is inseparable from Californian specimens of this species and also exhibits some variation in the definition of the tegminal bars. The color of the disk of the wings varies slightly, the blue being quite rich and deep in some (two) specimens. This species has been recorded from Hermosillo, Sonora, and is here noted from Arizona for the first time.

**SPHARAGEMON** Scudder.

**Spharagemon collare** (Scudder).

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♀.

This specimen appears to be perfectly typical of race *angustipenne* Morse when compared with Salt Lake (topotypic) material.

**TOMONOTUS** Saussure.

**Tomonotus ferruginosus** Bruner.

Carr Canyon, Huachuca Mountains, August (Skinner), 6 ♀. Palmerlee, July (Schaeffer), 1 ♀.

These specimens show that glaucous caudal tibiae are also present in the female, the majority of the specimens examined approaching the above color closer than "pale greenish yellow," given for the female in the original description. Several of the individuals examined also exceed the measurements given by Bruner, the maximum in the series being: length of body 38 mm.; length of pronotum 11; antennæ 12; tegmina 31; caudal femora 20.

*Tomonotus aztecus* (Saussure).

Douglas, August (F. H. Snow), 1 ♂.

This specimen is typical of *aztecus*, as ascertained by comparison with Mexican material, except for the parallel margins of the frontal costa, which is not constricted ventrad of the ocellus as in the majority of the other individuals examined. As several undoubted *aztecus* have the constriction very slight, I would consider the absence of it as an individual peculiarity.

**MESTOBREGMA** Seudder.*Mestobregma rubripenne* (Bruner).

Palmerlee, August 7, 1905 (Schaeffer), 1 ♀. Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 7 ♀, 4 ♂. September 22 and 27, 1905 (Biederman), 2 ♀.

The coloration of the disk of the wing in this species is yellow as well as red, but three of the above series being colored with the latter.

**CONOZOA** Saussure.*Conozoa carinata* n. sp.

Types: ♂ and ♀; Carr Canyon, Huachuca Mountains, Cochise Co., Arizona. August (♂) and October 20 (♀), 1905. Male collected by Skinner in Coll. Acad. Nat. Sci. Phila., female collected by Biederman in Hebard collection.

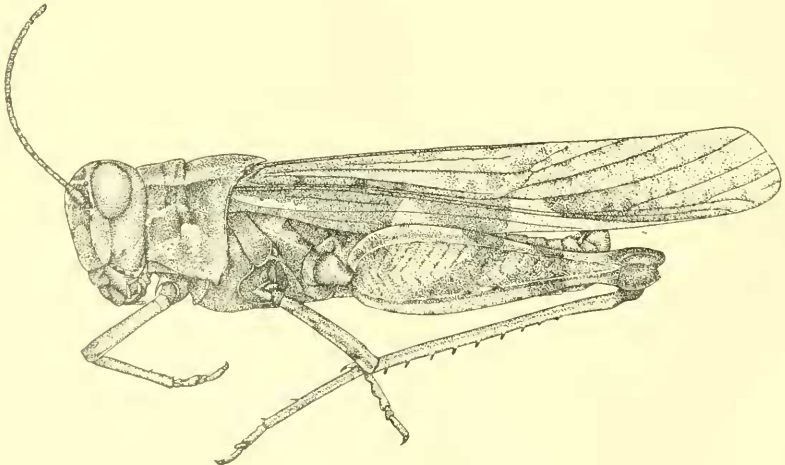


Fig. 2.—*Conozoa carinata* n. sp. Lateral view of male type. ( $\times 4$ .)

Allied to *C. behrensi*, *sulcifrons* and *acuminata*, differing from the first two in the more elevated median carina of the pronotum, the more

compressed pronotum and the color of the caudal tibiae. Of these two forms it is closely related to *sulcifrons* on account of the slender build of that species. From *acuminata* it differs in the more elevated pronotal carina and the color of the caudal tibiae.

Size small (♂) or medium (♀); distinctly compressed, moderately slender. Head deep, greatest width ventrad; occiput well rounded and distinctly elevated above the general level of the disk of the pronotum, interocular space in the male narrower than the width of the eye, in the female very slightly exceeding the width of the eye; fastigium deeply excavate in the male, considerably excavate in the female, median carina subobsolete in both sexes, lateral carinae well elevated, the narrowed cephalic section of the fastigium deeply depressed; lateral foveolae trigonal, moderately impressed; frontal costa slightly constricted dorsad and immediately ventrad of the ocellus, regularly expanding toward the clypeus, deeply sulcate throughout the length except for a small dorsal section which is shallowly so; eyes ovoid, flattened cephalad, moderately prominent in the male, little so in the female, in length slightly exceeding (female) or about equalling (male) the infraocular sulcus; antennae distinctly exceeding the head and pronotum in length in both sexes. Pronotum distinctly flattened, disk with the median carina distinct, moderately high, well divided by the principal transverse sulcus, the division of the prozonal section being merely an indentation and not a complete deep incision as is the pro-metazonal separation;<sup>8</sup> prozona contained about one and one-half times in the length of the metazona, cephalic margin obtuse-angulate, concave laterad, caudal margin slightly acute-angulate in the male, rectangulate in the female; lateral angles distinctly marked, not continuous, carinate in the immediate vicinity of the principal sulcus; lateral lobes distinctly deeper than long, ventral margin oblique, the ventro-caudal angle

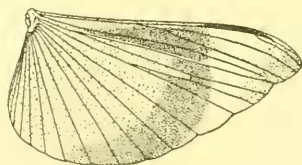


Fig. 3.—*Conozoa carinata* n. sp.  
Wing of male type. (× 2.)

produced into an acute process; surface of the dorsum with a number of low but distinct asperities in the male and with weak longitudinal strigae in the female. Interspace between the mesosternal lobes very strongly transverse in both sexes. Tegmina very considerably exceeding the tips of the abdomen and caudal

<sup>8</sup> In the male type the carina of the prozona is without the cephalic (prozonal) indentation, a condition found to be approached in three of the series examined and which appears to be without taxonomic value.



femora; costal margin with a distinct arcuation in the distal third, apex narrowly and very obliquely truncate, sutural margin nearly straight; intercalary vein strong, median in position for the greater part of its length but approaching the median vein distad. Wings ample but rather narrow, the greatest width contained nearly twice in the length; apex rather narrowly rounded. Caudal femora very slightly exceeding the apex of the abdomen in the male, in the female falling very little short of the same,<sup>9</sup> in form moderately robust; caudal tibiae with nine spines on the external margins.

General color wood brown in the male, mars brown in the female, in both sexes blotched and marked with clove brown or blackish. Head dull in the female, the markings obscure and chiefly consisting of postocular and arcuate occipital bars, the facial carinae being regularly beaded and the plain surfaces punctate with the darker colors, eyes russet, antennae wood brown with alternating segments generally marked with bistre; head of the male nearly completely washed with ecru drab, the dorsum more sprinkled with darker than the other surfaces, three occipital bars as well as the postocular bars being developed, while the pattern of the facial carinae approaches that of the female, eyes as in the female and with a distinct dark continuation of the postocular bar passing through them, antennae similar to those parts in the female but the paler parts are inclined toward ecru drab. Pronotum with the dorsum of the general color, the median carina, asperities and beading of the caudal margin of the darker color; lateral lobes dark dorsad, pale ventrad, the two shades marbled mesad and the margins beaded. Tegmina with a solid median and proximal blotch on the costal area, while a third distal spot is faintly indicated, intervals between the spots very light, sutural margin with the venation infuscate, distal third of the discoidal field hyaline except for the finely lined veins. Wings with the fuscous band placed very slightly distad of the middle and considerably narrowed cephalad, of greatest width at the point where it touches the periphery of the wing, here about one-fifth the length of the wing, and continued very little toward the internal margin of the wing, spur distinct, thick, extending slightly more than half way to the base of the wing; color of the disk pale sulphur yellow in the male, very weak primrose yellow in the female, apical portion hyaline except for the infuscation of a few veins near the immediate apex. Abdomen and ventral surface sulphur

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<sup>9</sup> In this sex the abdomen is slightly distended from the normal and deduction has been made for this extension.

yellow. Cephalic and median limbs of the general colors, imperfectly annulate and sprinkled the darker on the lighter, the cephalic limbs in the male clouded with eeu drab. Caudal femora with the genicular region blackish, a distinct pregenicular annulus of pale wood brown present, the lateral face with three oblique fasciae of the darker color, the distal of which is the only one which clouds the ventral face to any great extent, in the male the lighter areas are almost bluish white; caudal tibiae Naples yellow with the proximal portion clouded and the genicular section and the tips of the spines blackish.

*Measurements.*

	♂	♀
Length of body, . . . . .	17.8 mm.	30.5 mm.
Length of pronotum, . . . . .	4.2 "	6.4 "
Length of tegmen, . . . . .	18.5 "	25.7 "
Greatest width of tegmen, . . . . .	3.5 "	4.5 "
Length of caudal femur, . . . . .	10.2 "	14.5 "

A series of four males and three females have been examined in addition to the types, one from Palmerlee (Schaeffer; September 5), the others from Carr Canyon (Biederman; September 22, 24, October 8 and 28, 1905). The Palmerlee male is lighter in color than the four Carr Canyon male specimens available; this not only being true of the brown shades but of the disk of the wings as well, those parts being of the same shade as in the female. One of the female paratypes is very similar to the type, another is slightly paler and the third decidedly paler with the color contrasts much reduced and in some cases absent. The size appears to vary little, and in structure the chief variation worthy of note is the degree of "blocking" of the dorsal portion of the frontal costa. The fuscous band of the wing is carried nearer to the internal margin of the wing in some specimens than in others.

*Trimerotropis fasciola* McNeill.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 4 ♂. Palmerlee (Schaeffer), August 7, 1905, 1 ♂.

These specimens agree very well with McNeill's description, except that they are slightly larger with distinctly longer tegmina, a feature of variation well exhibited by series of the closely related *T. bruneri*. This form is extremely close to *bruneri*, appearing somewhat slenderer and with a narrower fastigium and wider tegminal bars.

*Trimerotropis alliciens* Seudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂, 1 ♀. September 24 and 28, October 8, 1905 (Biederman), 1 ♂, 3 ♀. Palmerlee, August 7, 1905 (Schaeffer), 1 ♀.

In several of these specimens the elytral bands are more distinct than in others. This species is clearly a member of the *citrina* group.

***Trimerotropis laticincta* Saussure.**

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂; October 8 and 20, 1905 (Biederman), 3 ♂, 2 ♀. Palmerlee, September (Schaeffer), 1 ♂. Douglas, August (F. H. Snow), 1 ♂.

These specimens are true *laticincta*, although the validity of this as distinct from *latifasciata* appears rather doubtful.

***Trimerotropis magnifica* n. sp.**

Type: ♂; Carr Canyon, Huachuca Mountains, Cochise Co., Arizona, August, 1905 (Henry Skinner). [A. N. S. Phila.]

This very large and striking new species is allied to *T. tolteca* and *pistrinaria* Saussure, but differs from both in the very much greater size, and from *tolteca* in the presence of a hyaline distal section on the wings, as well as from *pistrinaria* in the practical absence of the usual ulnar spur on the wing.

Size very large (for the genus); form moderately robust. Head with the occiput rounded and slightly elevated above the level of the disk of the pronotum, interspace between the eyes as broad as the greatest width of the disk of the fastigium; fastigium considerably

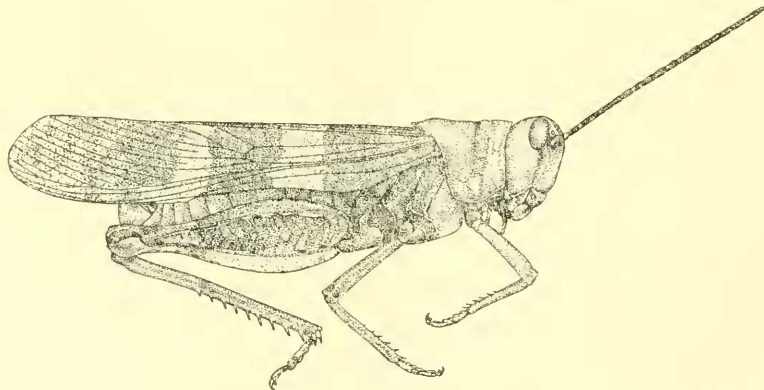


Fig. 4.—*Trimerotropis magnifica* n. sp. Lateral view of type. ( $\times 1\frac{1}{2}$ .)

declivent, the slope of the same being a regular continuation of the arch of the occiput, lateral carinae of the fastigium parallel caudad, regularly approaching one another cephalad, median carina faintly indicated caudad; lateral foveolae undefined, no ventral bounding ridge in the usual position; frontal costa considerably constricted dorsad, broader and subequal for a distance dorsad and ventrad of the ocellus, on the

ventral portion of the face the costal carinae expand in an undulating fashion, sulcation distinct but not very deep, in fact shallow in the constricted dorsal portion; eyes not prominent, somewhat shorter than the infraocular sulcus; antennae heavy, in length exceeding that of the head and pronotum combined by that of the head alone. Pronotum with the disk but very slightly tectate, prozona contained about one and three-fourths times in the metazona; cephalic margin very slightly arcuate, caudal margin rectangulate with the margins slightly undulate; median carina very faintly indicated on the prozona, distinct but very fine on the metazona; lateral angles faintly tuberculate on the prozona, rounded shoulders on the metazona; lateral lobes of the pronotum with the depth slightly exceeding the dorsal length, caudal margin descending with a slight cephalad trend, ventral margin irregularly rounded. Interspace between the mesosternal lobes distinctly but not strongly transverse; interspace between the metasternal lobes slightly transverse. Tegmina four and a half times the length of the pronotum, exceeding the apices of the caudal femora and the abdomen by the pronotal length, the greatest width contained about four and a half times in the length; costal margin with the distal third regularly arcuate, apex obliquely truncate; intercalary vein closer to the median than to the ulnar vein throughout its length. Wings ample, rather broad, the greatest width contained about one and three-fourths times in the length; apex obliquely truncate, axillary field with the margin distinct arcuate. Abdomen with the subgenital plate rather broad; cerci simple, straight, substyiform, blunt. Cephalic and median limbs rather slender; caudal femora robust, not strongly but regularly inflated, the ventral carina distinctly elevated, length about two and one-half times that of the pronotum; caudal tibiae with nine spines on the lateral margins.

General color pale ochraceous-buff overlaid with bistre. Head pale ventrad and on the face, dark dorsal, genae lightly mottled; eyes burnt umber; antennae, except for the paler two proximal joints, clove brown. Pronotum nearly uniform bistre. Tegmina with solid median and proximal dark transverse bars,<sup>10</sup> the latter confluent with the base of the tegmen and both extending solidly across the same,<sup>11</sup> a premedian bar is present but not as regular as the others, the pale interspaces between the three bands being sharply defined and distinctly but not greatly narrower than the average of the darker bars; apical fourth

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<sup>10</sup> These bars are darker and nearly blackish on the costal field.

<sup>11</sup> The median is a little broken on the anal field.

changing from subhyaline to hyaline with about a half dozen subquadrate blotches of the darker color. Wings with the band clove brown in color, crossing the wing immediately distad of the middle, extending in a complete arc from the costal to very near to the internal margin, regularly narrowing in width from the axillary field caudad,

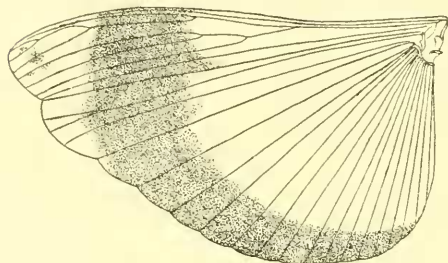


Fig. 5.—*Trimerotropis magnifica* n. sp.  
Wing of type. ( $\times 1\frac{1}{2}$ .)

the width on the axillary field being about two-sevenths the length of the tegmen, spurs hardly indicated; disk pale sulphur yellow; apical area hyaline except for several blotches of dark color, no suffusion however being present. Abdomen dull naples yellow. Caudal femora of the lighter general color inclined to vinaceous-

pink on the ventral portion of the lateral face, dorsal and bounding carinae of the paginae sparsely beaded, face of the paginae suffused with the dark color, broad pregenicular annulus of the pale color laterad; genicular regions mingled drab and bistre, internal and ventral face of the femora blackish except for the pregenicular annulus and a proximal portion, both of which are Chinese orange; caudal tibiae orange vermillion the genicular section and tips of the spines black; caudal tarsi buffy ventrad washed with orange vermillion dorsad.

#### Measurements.

Length of body, . . . . .	38.5 mm.
Length of antenna, . . . . .	19 "
Length of pronotum, . . . . .	9 "
Length of tegmen, . . . . .	39.5 "
Length of caudal femur, . . . . .	21.5 "

The type is the only specimen of this handsome species seen by the author.

*Trimerotropis melanoptera* McNeill.

Carr Canyon, Huachuca Mountains, August (Skinner), 1 ♀.

This specimen is quite peculiar in that the proximal light area of the wings is not yellow but creamy white. The width of the fuscous wing band is about half the total length of the wing, and the internal faces of the caudal femora have a single pregenicular orange red band.



**Trimerotropis vinculata** Scudder.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂, 1 ♀. Benson, July (Schaeffer), 1 ♀. Douglas, August (F. H. Snow), 1 ♂, 2 ♀. Carr Canyon, Huachuca Mountains, August (Skinner), 1 ♂. September 23 and 27, October 8 and 20 (Biederman), 15♂, 21 ♀.

Several specimens of this common and widely distributed species from Grand Canyon of the Colorado (Skinner, July 11) are also in hand.

**Trimerotropis cyaneipennis** Bruner.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 6 ♂, 6 ♀. September 24, 1905 (Biederman), 6 ♂, 4 ♀. Palmerlee, September (Schaeffer), 1 ♀.

Scudder's *T. cyanea*<sup>12</sup> appears to be a synonym of this species.

**HADROTETTIX** Scudder.**Hadrotettix trifasciatus** (Say).

Carr Canyon, Huachuca Mountains, August (Skinner), 2 ♂, 3 ♀. September 23 (Biederman), 1 ♂, 2 ♀. Palmerlee, July 31 (Schaeffer), 1 ♂.

**TREPIDULUS** McNeill.**Trepidulus melleolus** (Scudder).

1902. *Conozoa melleola* Scudder, Proc. Davenp. Acad. Sci., IX, p. 34, pl. II, fig. 2. [La Cueva, Organ Mountains, New Mexico.]

1905. *Mestobregma gracilipes* Caudell, Proc. U. S. Nat. Mus., XXVIII, p. 471, fig. 5. [Nogales and Huachuca Mountains, Arizona.]

1906. *Trepidulus gracilipes* Bruner, Biol. Cent.-Amer., Orth., II, p. 185.

San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂.

There is no doubt in the author's mind that *Conozoa melleola* is the species later described by Caudell as *Mestobregma gracilipes*. A comparison of the descriptions shows the identity of the two species.

**HELIASTUS** Saussure.**Heliastus benjamini** Caudell.

Carr Canyon, Huachuca Mountains, August (Skinner), 4 ♂, 2 ♀. September 22 and 23, October 20 and 24 (Biederman), 3 ♂, 8 ♀. Palmerlee, August 7 (Schaeffer), 1 ♀.

This series shows that in general color some specimens are decidedly grayish, while others are warm brown, the tegminal bars varying little in intensity. In some female individuals the metanotum is slightly more tumid than in others.

<sup>12</sup> *Proc. Davenp. Acad. Sci.*, IX, p. 36.



*Heliastus aridus* (Bruner).

Carr Canyon, Huachuca Mountains, August (Skinner), 1 ♀. Palmerlee, August (Schaeffer), 1 ♂, 1 ♀. San Bernardino Ranch, 3,750 feet, August (F. H. Snow), 1 ♂.

The Carr Canyon specimen is grayish, the Palmerlee individuals reddish.

#### **BRACHYSTOLA** Scudder.

*Brachystola intermedia* Bruner.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 3 nymphs. September 23 and 24, 1905 (Biederman), 5 ♂, 3 ♀. San Bernardino Ranch, 3,750 feet, August, 1905 (F. H. Snow), 1 nymph.

This species, recently described from Sonora(?) and Mazatlan, Mexico, was considered by the describer to possibly reach "south-western Arizona in the vicinity of the Huachuca Mountains," an opinion which the present material well sustains. In size the adults in this series are fairly uniform, only one male being slightly smaller than the others, while the coloration is distinctly more uniform than usual in series of this genus. As the male sex was not in the possession of the describer, the measurements of an average male may be of interest:

Length of body, . . . . .	41 mm.
Length of pronotum, . . . . .	11.5 "
Caudal width of dorsum of pronotum, . . . . .	7.7 "
Length of tegmen, . . . . .	7.8 "
Length of caudal femur, . . . . .	25.5 "

#### **PHRYNOTETTIX** Glover.

*Phrynotettix magnus* (Thomas),<sup>13</sup>

Carr Canyon, Huachuca Mountains, August (Skinner), 7 ♂, 5 ♀. September 24 and 27 and October 8 (Biederman), 9 ♂, 2 ♀. Palmerlee, August (Schaeffer), 1 ♂, 1 ♀. San Bernardino Ranch, 3,750 feet (F. H. Snow), 1 ♂, 1 ♀.

This series exhibits considerable variation in size in both sexes, and also some difference in the length of the metanotum and the character of the caudal angle of the same. In color numerous variations are observed, hardly two specimens appearing exactly the same; variation in base color, washes, pronotal margining and maculations, as well as

<sup>13</sup> By the acquisition of new material and the re-examination of old the author has been compelled to modify his opinion expressed in 1902 (*Proc. Acad. Nat. Sci. Phila.*, 1902, pp. 595-597) regarding the synonymy of species of this genus. Thomas's *magnus* is distinct from *tshivarensis*, as is also Bruner's *robustus*. The specimens recorded from El Paso, Texas, Alamogordo, Otero Co., and Lake Valley, Sierra Co., New Mexico, are of the latter species.

femoral bars and fine abdominal maculations, all combining to give numerous color schemes of browns and grays. A few specimens are reddish and others rather blackish.

*Schistocerca vaga* (Scudder).

Carr Canyon, Huachuca Mountains, August (Skinner), 1 ♂, 4 ♀, 1 nymph. October (Biederman), 4 ♂, 7 ♀. Palmerlee, August (Schaeffer), 1 ♂.

As is usual in this species a great amount of individual color variation is present in the above series. In some specimens the pale dorsal line is almost obsolete, in one completely lacking, in others, particularly males, strongly marked. The tegminal maculations are of variable intensity, in two specimens being extremely weak, while the dark femoral bars and pale ventral section of the lateral lobes of the pronotum are subject to equal variations, but as a rule the femoral bars are distinct in the individuals with a well contrasted color pattern.

*Schistocerca venusta* Scudder.

Carr Canyon, Huachuca Mountains, August (Skinner), 6 ♀, 1 nymph. September and October (Biederman), 4 ♂, 7 ♀. Huachuca Mountains, July (Schaeffer), 1 ♂.

The above series contains specimens extremely close to *S. shoshone*, and the author inclines strongly toward the belief expressed by Mr. Caudell that *venusta* is probably a form of *shoshone*.<sup>14</sup> Both sexes of this form vary considerably in size, and in some individuals the metazona is distinctly bullate dorsad instead of nearly plane as in the majority. The color of the caudal tibiae varies from glaucous and purplish pink to very dull purple.

**CONALCÆA** Scudder.

1897. *Conalcaea* Scudder, Proc. U. S. Nat. Mus., XX, pp. 9, 23.

Type.—*C. miguclitana* Scudder.

*Conalcaea neomexicana* Scudder.

Carr Canyon, Huachuca Mountains, September 22-24 (Biederman), 2 ♂, 8 ♀.

This series is fairly uniform in coloration, such variation as is present being in the shade of browns and yellows which make up the base colors. The postocular bar is more distinctly marked in some specimens than in others, while in some individuals the black lateral bars of the prozona are slightly broken caudad of the yellowish oblique bar. The caudal tibiae vary from pinkish red to deep chrome yellow.

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<sup>14</sup> *Proc. U. S. Nat. Mus.*, XXVIII, p. 476.

*Conalocæa huachucana* n. sp.

Types: ♂ and ♀; Carr Canyon, Huachuca Mountains, Cochise Co., Arizona. September 24, 1905. (Biederman.) [Hebard Collection.]

Allied to *C. miguelitana* and *C. neomexicana*, differing from the former in the form of the cerci and some features of the coloration, and from *C. neomexicana* in the characters which separate *miguelitana* from the same, the form of the cerci, however, being very similar to *neomexicana*.

Size slightly smaller than *C. neomexicana*; form subfusiform, robust; surface rather more glabrous in the male than in the female. Head with the occiput very slightly arched, not elevated above the level of the disk of the pronotum; interspace between the eyes rather narrow, in the male no wider, and in the female but little wider than the proximal antennal joint; fastigium roundly deflected, the greatest width very considerably greater than that of the interspace between the eyes, width of the scutellum of the fastigium very slightly broader than the same, moderately but not greatly excavated; frontal costa rather broad, slightly constricted dorsad, parallel ventrad and fading before reaching the clypeus, dorsal section not sulcate (slightly impressed in the male) but deeply punctate, area around the ocellus and for a short distance ventrad broadly and shallowly sulcate; eyes oval with the cephalic border flattened, in length half again as long as the infraocular sulcus in the male, about a quarter again as long in the female; antennæ moderately depressed proximad, in the male very

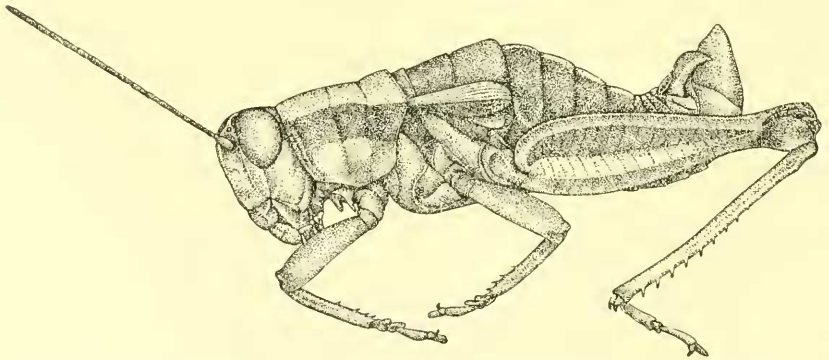


Fig. 6.—*Conalocæa huachucana* n. sp. Lateral view of male type. ( $\times 3$ )

slightly shorter than the head, pronotum, mesonotum and metanotum together, in the female equal to the head, pronotum and mesonotum. Pronotum with the disk moderately tectate; cephalic margin subtruncate, and the caudal margin with a broad triangular emargination

in both sexes; median carina distinct but hardly elevated, lateral angles distinct, obtuse, slightly more rounded on the metazona than on the prozona, the angles regularly expanding caudad throughout their length, the expansion being much more marked in the female than in the male; metazona about half the length of the prozona, the metazona also more closely punctate than the prozona; lateral lobes with the length distinctly one and one-half times the depth in the male, less than one and one-half times the depth in the female, cephalic margin very slightly arcuate, caudal margin with a concave-arcuate cephalic trend, the ventro-caudal angle thick and very slightly recurved, ventral margin arcuate with the cephalic half sinuate, sulci well marked on the lateral lobes. Mesonotum and metanotum together slightly shorter than the pronotum in the male, distinctly shorter than the pronotum in the female, both tectate and carinate as is the pronotum. Prosternal spines erect, thick, apex slightly blunted; interspace between the mesosternal lobes slightly longer than broad in the male, subquadrate in the female; interspace between the metasternal lobes very narrow in the female, lobes contiguous in the male. Tegmina reaching to the caudal margin of the metanotum, lanceolate, about two and a half times as long as broad in each sex, slightly narrower in the male than in the female; apex rather broadly rounded. Abdomen slightly compressed and with a low median carina; furcula developed as very broad, short, trigonal plates, no longer than the segment from which they arise; supra-anal plate produced trigonal, apex bluntly rounded, median sulcus narrow and deep in the proximal half; cerci moderately compressed with the proximal half thick and subequal, the distal half falciform, the cephalic margin slightly elevated and arcuate around to the acute apex, the sublamellate portion of the distal half curved in toward the median line of the body; subgenital plate subpyramidical, the apex well elevated above the margin, the two being connected by a blunt ridge. Cephalic and median limbs robust in the male, rather weak (for a Melanoplid) in the female; caudal femora regularly tapering, not greatly inflated, the greatest width in the male contained about three and a half times in the length; caudal tibiae with nine spines on the external margin.

General colors russet and seal brown. Head with the postocular bar not strongly marked; eyes varying from burnt umber to raw umber;



Fig. 7.—*Conalca huachuana* n. sp. Dorsal view of apex of male abdomen. (× 3.)

antennæ pale proximad, dark distad. Pronotum with the continuation of the postocular bar solid, deep seal brown in the male, slightly weaker in the female, extending across the whole of the lateral lobes and in depth being nearly half that of the same, the ventral line being more definite mesad than cephalad and caudad; ventral portion of the lateral lobes pale russet. Dorsum of the mesonotum and metanotum similar to the dorsum of the pronotum, metathoracic epimera dorsad to the line of the dorsal margin of the tegmina and the mesothoracic epimera shining seal brown, episterna russet. Tegmina with a dorsal section russet (paler in the male); ventral section shining seal brown. Abdomen of the lighter general color with longitudinal series of contiguous seal brown blotches on the dorsal section laterad of the median line, which is a very striking pale bar, these blotches varying in intensity in the sexes (stronger in the male) and in individuals; apex of the male abdomen and the ventral surface of the same touched with orange rufous. Cephalic and median limbs brownish touched with olive green; caudal femora vandyke brown dorsad, the dorsal half of the paginal area blackish brown, ventral half and ventral sulcus cream color washed slightly with greenish, genicular lobes pinkish buff touched with scarlet vermilion; caudal tibiæ and tarsi scarlet vermilion, the spines tipped with black.

*Measurements.*

	♂	♀
Length of body, . . . . .	21 mm.	28 mm.
Length of pronotum, . . . . .	5 "	6 "
Cephalic width of disk of pronotum, . . . . .	2.7 "	3.5 "
Caudal width of disk of pronotum, . . . . .	4.2 "	6 "
Length of tegmen, . . . . .	4.3 "	5 "
Length of caudal femur, . . . . .	13 "	14.7 "

In addition to the types a series of six males and seven females of this species have been examined, all of which except one pair from Palmerlee (in coitu; August 7, 1905; Schaeffer) are paratypic (September 23 and 24). In size but little variation is presented, and in color such as exists is chiefly in the depth of the coloration, the two extremes, both females, one with russet predominating and the other with seal brown the prevailing color, can readily be given their proper association, as the distinctive color pattern is essentially the same. In some specimens there is a tendency to breaking in the pronotal continuation of the postocular bar, but in no case is this as complete and strongly defined as in *C. neomexicana*.

**MELANOPLUS** Stål.**Melanoplus lakinus** Scudder.

Carr Canyon, Huachuca Mountains, September 22-27, October 8-20 (Biederman), 15 ♂, 13 ♀.

These individuals would probably be Scudder's *M. sonorae*, as the pronotum is less expanded caudad than in average Colorado specimens of *lakinus*, and the lateral faces of the caudal femora are either not at all or but slightly marked with the usual bars of *lakinus*. In the author's opinion *sonorae* is no more than a geographic race of *lakinus*, and may hardly be of such rank, as Colorado specimens of *lakinus* vary greatly in size, somewhat in the expansion of the pronotum and occasionally have the lateral face of the caudal femora without distinct markings. The reddish color of the caudal tibiae of *sonorae*, as mentioned in the original description, is possibly due to the type specimens having been immersed in a liquid preservative, as the individuals in hand all have the tibiae glaucous.

**Melanoplus aridus** (Scudder).

Carr Canyon, Huachuca Mountains, September 23 and 24, October 8 (Biederman), 2 ♂, 1 ♀. Palmerlee, August 7 (Schaeffer), 1 ♀. Douglas, August (F. H. Snow), 1 ♀.

From these specimens it is evident that this species varies considerably in size, in parts of its range at least, the Cochise County individuals being much larger than representatives from Florence, Arizona. These latter are distinctly smaller than the measurements given by Scudder, while a pair from Carr Canyon measure as follows:

	♂	♀
Length of body, . . . . .	21.5 mm.	29.5 <sup>15</sup> mm.
Length of pronotum, . . . . .	5 "	7 "
Length of tegmen, . . . . .	4.8 "	5.5 "
Length of caudal femur, . . . . .	12.5 "	16 "

**Melanoplus desultorius** n. sp.

Types: ♂ and ♀; Carr Canyon, Huachuca Mountains, Cochise Co., Arizona. September 24, 1905 (Biederman). [Hebard Collection.]

Allied to *M. aridus* and closely resembling it superficially, but differing in the more sulcate frontal costa, the flattened and moderately expanded cerci and in the interspace between the mesosternal lobes, which is strongly longitudinal in the male, slightly longitudinal in the female. In the shape of the cerci this species approaches *M. humphreysii*, but the caudal margin of the pronotum is as in *M. aridus*.

<sup>15</sup> Abdomen distended beyond normal size.



Size medium; form of medium build. Head with the occiput rounded but hardly elevated above the dorsum of the pronotum, interspace between the eyes slightly narrower ( $\sigma^7$ ) or slightly broader ( $\varphi$ ) than the proximal antennal joint, fastigium distinctly broader than the interocular space, rather deeply ( $\sigma^7$ ) or shallowly ( $\varphi$ ) sulcate, the sulcation extending caudad between the eyes; frontal costa distinctly ( $\sigma^7$ ) or slightly ( $\varphi$ ) wider than the interspace between the eyes, impresso-punctate dorsad of the ocellus in the male, punctate in the female, in the male strongly sulcate around and ventrad of the ocellus, in the female moderately sulcate at and for half the distance ventrad of the ocellus, the costal margins slightly constricted dorsad and very slightly approximate ventrad; eye subovate in the male, ovate with the cephalic margin flattened in the female, when viewed from the dorsum the eyes are moderately prominent in the male, very slightly prominent in the female; in length considerably ( $\sigma^7$ ) or not greatly ( $\varphi$ ) longer than the infraocular portion of the genæ; antennæ in the male slightly shorter than the head, pronotum and tegmina together, in the female very slightly longer than the head and pronotum together. Pronotum with the disk very gently arched transversely, the lateral angles rounded, the median carina distinct on the cephalic half of the

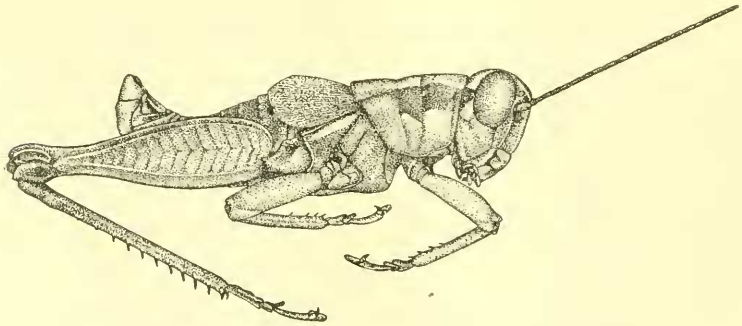


Fig. 8.—*Melanoplus desultorius* n. sp. Lateral view of male type. ( $\times 3$ .)

prozona and on the metazona, more elevated on the metazona and obsolete on the caudal half of the prozona; cephalic margin very slightly arcuate, the caudal margin very obtusely angulate; metazona closely punctate, in the female also with very fine transverse strigæ, prozona about one and three-eighths times the length of the metazona, principal transverse sulcus well marked in both sexes, the prozonal sulci breaking the median carina in the male, not dividing the same in the female; lateral lobes half again as long as deep in the male, slightly

shorter in the female, the lobes moderately tumid in their cephalic portion, particularly of the prozona, the caudal margin descending obliquely cephalad, the ventral margin slightly emarginate cephalad. Prosternal spine thick, somewhat compressed in the male, directed caudad; interspace between the mesosternal lobes half again as long as broad in the male, slightly longer than broad in the female; metasternal lobes contiguous in the male, subcontiguous in the female. Tegmina in the male subovate, reaching nearly to the distal margin of the proximal abdominal segment and slightly shorter than the pronotum; in the female suborbicular, reaching to about the middle of the same segment and distinctly shorter than the pronotum, the apical margin slightly subangulate in the male, broadly subtruncate in the female, the greatest breadth of the tegmina in the male about two-thirds the length, in the female slightly less than the length. Abdomen moderately compressed, the apex in the male slightly expanded and erected but not recurved; furcula developed as short, well separated spines, not longer than the segment from which they arise and slightly diverging distad; supra-anal plate trigonal, the median sulcus narrow and extending about two-thirds the length of the plate; cerci with the length not more than twice that of the broad base, from which the remainder of the cercus is sharply and regularly contracted to about half the basal width, the narrow portion being slightly curved dorsad, the apex acute and the ventral margin slightly proximal of the apex with a blunt angle, in transverse plane the cerci are curved mesad and then bent sharply dorsad; subgenital plate slightly produced, moderately compressed, the apex slightly rounded ventro-dorsad. Cephalic and median limbs robust in the male. Caudal femora well developed but not strongly inflated, in the male very slightly exceeding the head, pronotum and tegmina in length, in the female distinctly exceeding these; caudal tibiae with ten to eleven spines on the lateral margins.



Fig. 9.—*Melanoplus desultorius* n. sp. Dorsal view of apex of male abdomen. ( $\times 4$ .)

General color clay color. Head with the vertex and occiput marked with a median longitudinal bar of seal brown, more or less broken into spots; postocular bar blackish-brown; face and genæ clouded and washed with drab, rather greenish-olive in the male; eyes russet; antennæ flame-scarlet, a little obscured distad and less brilliant in general color in the male (nearly vermilion) than in the female. Pronotum olive dorsad in the male, of the general color with a median wash of prout's brown on the prozona in the female; lateral lobes with

the dorsal half of the prozona shining blackish, a narrow continuation of this bar on the angle of the metazona being dull blackish, ventral portion of the prozonal lobes creamy buff against the blackish changing to the general color along the ventral margin and on the metazona. Tegmina broccoli brown with a strong steel-bluish tinge in the male; the ventral margin in both sexes narrowly marked with blackish and the minute interspaces between the veins showing up darker than the veins themselves; apical margin faintly ( $\sigma^7$ ) or distinctly ( $\varphi$ ) margined with buffy. Abdomen with the proximal segments marked with black dorsad, the remaining segments and the ventral surface chiefly maize yellow. Caudal femora with the ventral aspect and the ventral portion of the faces yellow, the dorsal section of the lateral face washed with pale olive-green, the dorsal face and the dorsal section of the internal face with a median and premedian bar of raw umber, genicular arches seal brown, a moderately well defined pregenicular annulus yellow, genicular lobes with a black basal spot, the remainder yellowish dorsad, greenish blue ventrad; caudal femora bottle green, the spines black, pale at their bases.

*Measurements.*

	$\sigma^7$	$\varphi$
Length of body, . . . . .	17.3 mm.	26.5 mm.
Length of pronotum, . . . . .	5 "	6.3 "
Length of tegmen, . . . . .	4.5 "	5 "
Length of caudal femur, . . . . .	11.7 "	14.2 "

In addition to the types a series of eleven topotypic specimens have been examined, two males and nine females (date identical with types). From these specimens it is evident that the species varies considerably in size, and apparently in both sexes, although the male material is necessarily not as conclusive as the female. In coloration the variation is chiefly in the brilliancy of the yellow areas and of the yellow values, the base color varying in the same ratio as the pure yellows. In several specimens the color of the dorsal section of the lateral faces of the caudal femora strongly encroaches on or suffuses the ventral section, and this is apparently irrespective of the strength of the yellow colors. In one female the whole of the lateral lobes except the blackish area is uniform cream-buff.

*Melanoplus flavidus* Scudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1  $\varphi$ . October 8. 16-17. 20, 1905 (Biederman), 4  $\varphi$ . Palmerlee, August 7, 1905 (Schaeffer), 1  $\varphi$ .

These specimens have the coloration much subdued and with gray-browns the predominating color value. The Palmerlee specimen is of a warmer brown than the others, and in the Carr Canyon series the yellows usually have a greenish cast.

**Melanoplus regalis** (Dodge).

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♀. September 23 and 24, October 8, 16-17, 1905 (Biederman), 4 ♂, 14 ♀. Palmerlee, June 13, 1905 (Schaeffer), 1 ♀.

A pair of this form was submitted to Prof. Bruner, who was responsible for the transference of Dodge's species from *Æoloplus* to this genus,<sup>16</sup> and his opinion confirmed the author's suspicion that they represented Dodge's very poorly described species. It belongs to the *femur-rubrum* series and must have a very great superficial resemblance to *M. sanguineus* Bruner,<sup>17</sup> judging from the description of the latter, and in a number of ways also suggests *M. corpulentus*, which, however, is very different structurally.

The coloration of the series examined is very interesting and shows considerable variation in the intensity of purplish-reds and greens, which on a yellowish ground and varied with umber markings constitute the main color features. In by far the majority of the specimens the green is conspicuous. In all the specimens the crimson ventral sulcus of the caudal femora and the glaucous tibiae are marked, and very little variation in the color of the same is noticed.

**Melanoplus corpulentus** Seudder.

Carr Canyon, Huachuca Mountains, September 21, 23 and 24, October 8, 16-17, 1905 (Biederman), 9 ♂, 7 ♀. Palmerlee, August 7, 1905 (Schaeffer), 1 ♂, 1 ♀.

This series varies considerably in size and somewhat in the intensity of pattern and general shade of the coloration; a few individuals have their general color more grayish than the average, others more yellowish. The caudal tibiae are glaucous in five of the series. The length of the tegmina and wings varies considerably and is more pronounced in the male than in the female.

**Melanoplus thomasi** Seudder.

Douglas, August, 1905 (F. H. Snow), 1 ♂.

This striking species is here recorded from Arizona for the first, this

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<sup>16</sup> In Gillette, Bull. 94, Colo. Agr. Exp. Sta., p. 55.

<sup>17</sup> Two specimens from the Garden of the Gods, Colorado, recently recorded by the author (*Proc. Acad. Nat. Sci. Phila.*, 1906, p. 406) as *sanguineus* prove on second examination to be *regalis*. The superficial resemblance between these two is so great that without authentic material the two are liable to be confused.

being only the fourth record for the species—Scudder having described it from Lerdo, Durango; Scudder and Cockerell recording it from Tularosa, New Mexico, and the present author examined and recorded seven specimens from the Sacramento Mountains, New Mexico.

*Phaetaliotes nebrascensis* (Thomas).

Carr Canyon, Huachuca Mountains, September 24, October 16–17, 1905 (Biederman), 1 ♂, 1 ♀. San Bernardino Ranch, 3,750 feet, August, 1905 (F. H. Snow), 1 ♂.

The individual from San Bernardino Ranch belongs to the form *volucris*, the others being the short-winged type.

When compared with Nebraska, Colorado and Indiana specimens the males appear to have the dorsal constriction of the frontal costa stronger than the average from those localities; but one Colorado specimen (Greeley, Colorado) differs in that portion being narrower than in the Arizona males. This species has been recorded from Tucson, Pima Co., Arizona.

*Dactylotum variegatum* (Scudder).

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♀. September 23 and 24, 1905 (Biederman), 5 ♂, 6 ♀. Palmerlee, June 23, 1905 (Schaeffer), 1 ♂.

The females of this series present considerable variation in size, one particularly being no larger than male individuals, while this one specimen is but little surpassed in size by another of the same sex. There is a very perceptible amount of variation in both sexes in the depth of the bluish pronotal markings.

TETTIGONIDÆ.

*Dichopetala brevihastata* Scudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂.

This species is the *D. brevicauda* Scudder of 1902, but not of 1900.<sup>15</sup> The former records are from southern New Mexico (several localities in the Mesilla Valley) and Mexico.

*Dichopetala lævis* n. sp.

Types: ♀ : Carr Canyon, Huachuca Mountains, Cochise Co., Arizona. August, 1905 (H. Skinner). [Acad. Nat. Sci. Phila.]

Allied to *D. brevihastata* Scudder, but differing in the shorter ovipositor, which is also slightly thicker distad than mesad and proximad, and has the margins unarmed, and also in the smaller general size and shorter, more robust limbs.

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<sup>15</sup> Vide Morse, *Psyche*, IX, p. 381.



Size small; form very distinctly compressed. Head with the vertex regularly declivent to the narrow but low fastigium; eyes ovate, small but rather prominent; antennae slightly more than twice the length of the body proper, rather thick in the proximal portion. Pronotum with a moderate mesad constriction; in length slightly more than twice that of the head; cephalic margin truncate, caudal margin very faintly obtuse-angulate, lateral lobes shallow, the greatest depth contained slightly more than twice in the length. Tegmina very short, the extreme apex alone visible beyond the caudal margin of the pronotum. Styles very short, thick, conic; ovipositor about equal to the cephalic femur in length, the proximal third nearly subequal in width, from which, however, it gradually enlarges to the distal section, which is distinctly but not greatly broader than the proximal portion; the caudal margin is strongly curved dorsad in the distal portion, the extreme apex, being rounded and nearly dorsad in position, all the margins unarmed; subgenital plate with a small but deeply and strongly rounded apical emargination. Cephalic limbs slender, the

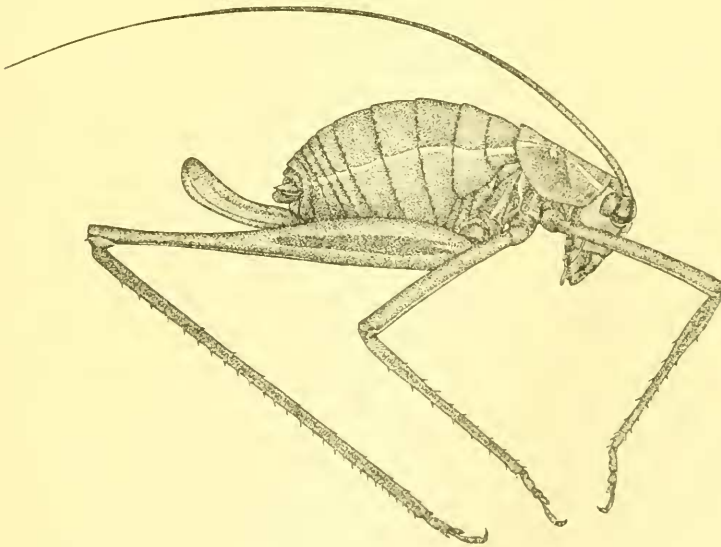


Fig. 10.—*Dichopetala larvis* n. sp. Lateral view of type. ( $\times 3$ .)

bullae quite small; median limbs slightly longer than the cephalic. Caudal femora nearly two and one-half times the length of the cephalic femora, well inflated in the proximal half; caudal tibiae exceeding the length of the femora by nearly the dorsal length of the head.



General color ochraceous-buff. Head with the face overlaid with very pale greenish; palpi oil green; eyes russet; dorsum of the head with a narrow median whitish line extending from the fastigium caudad, enclosed laterad by line borders of pansy purple, a broad bar of which borders dorsad the narrow whitish postocular streak; antennæ proximad very pale greenish overlaid with purplish, distad clear oil green. Pronotum with the usual situation of the lateral carinæ marked with whitish, as is also the entire cephalic margin and also the other margins of the lateral lobes, caudal margin beaded with small purplish spots. The median fine white line with its purplish borders is also continued on the pronotum and mesonotum, while the mesonotum and metanotum are beaded caudad as on the pronotum, the lateral whitish bars of the pronotum being also continued on these sections. Abdominal segments beaded caudad as with the thoracic segments, the whitish lateral lines also extending to the apex of the abdomen, the dorsal area between which is darker than laterad. Ovipositor russet, the immediate apex darker. Femora wood brown mottled with broccoli brown and on the caudal femora touched with a wash of greenish; caudal femora marked mesad and laterad in the proximal half with a pattern of short oblique brownish lines; tibiæ green, the cephalic and median pair brownish green proximad, clear dark green distad, the caudal pair dark clear green, spines narrowly tipped with black.

*Measurements.*

Length of body, . . . . .	13.5 mm.
Length of pronotum, . . . . .	4.5 "
Length of caudal femur, . . . . .	17.5 "
Length of ovipositor, . . . . .	7 "

The type is unique.

***Hormilia elegans* Scudder.**

Benson, July, 1905 (Schaeffer), 1 ♀. San Bernardino Ranch, 3,750 feet, August, 1905 (F. H. Snow), 1 ♀.

These specimens belong to the typical color form.<sup>19</sup> Caudell<sup>20</sup> has recorded this species from this region and the records now extend from Florence, Arizona, to the Mesilla Valley, New Mexico.

***Hormilia apache* n. sp.**

Types: ♂ and ♀; Carr Canyon, Huachuca Mountains, Cochise Co., Arizona, August, 1905 (H. Skinner). [Acad. Nat. Sci. Phila.]

<sup>19</sup> Vide Rehn, *Proc. Acad. Nat. Sci. Phila.*, 1904, pp. 572, 573.

<sup>20</sup> *Proc. U. S. Nat. Mus.*, XXVIII, p. 477.

Allied to *H. abbreviata* Bruner from Cuernavaca, Morelos,<sup>21</sup> but differing in the much longer tegmina and wings, the latter extending beyond the former, the well-defined humeral sinus of the lateral lobes of the pronotum and the more arcuate ventral margin of the same parts, the more recurved tips of the male cerci and the truncate subgenital plate of the same sex (this has distinct lateral angles and a very well-developed median protuberance in *abbreviata*). The form of the pronotum is very similar to that of *abbreviata*, and in this respect these species stand apart in the genus from the others which possess sharp lateral angles.

Size medium; form moderately compressed and elongate. Head with the occiput moderately globose, not elevated above the pronotum and regularly declivent to the narrow, compressed fastigium, which is truncate distad, subequal in the distal half and with distinct lateral

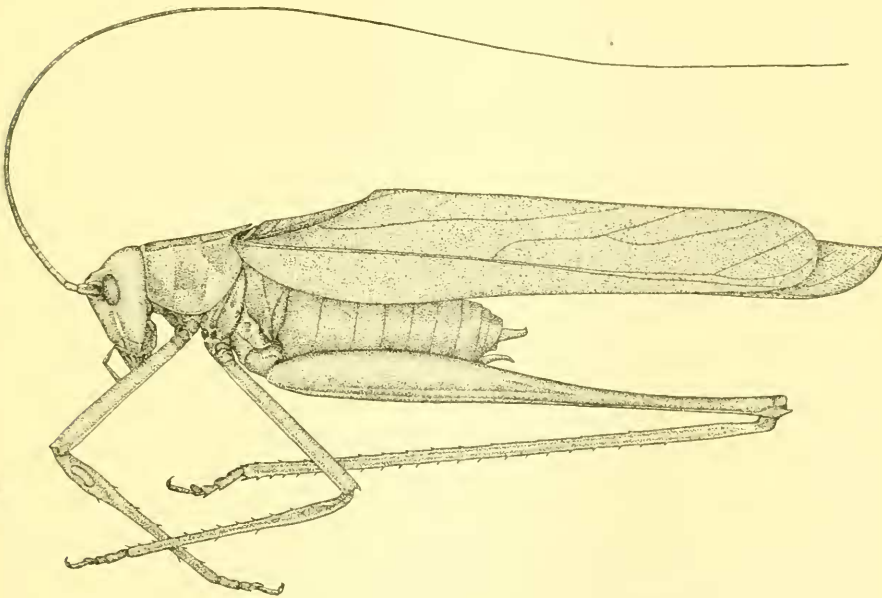


Fig. 11.—*Hormilia apache* n. sp. Lateral view of male type. (× 3.)

carinae, contiguous to the trigonal facial fastigium; eyes rather small, elliptical and prominent for their size; antennae with the proximal joint subtrigonal in section, in length slightly more than twice that of the tegmina. Pronotum with the dorsum deplanate, lateral angles sharp

<sup>21</sup> Topotypic specimen examined.

and subrectangulate, the width of the disk regularly expanding caudad, with, however, a very slight expansion at the cephalic margin; cephalic margin gently emarginate, caudal margin moderately arcuate with a very slight median emargination; lateral lobes slightly longer than deep, the humeral sinus distinct and angulate, but not wide or deep, the margin from the ventro-cephalad angle to the humeral sinus being rather regularly arcuate. Tegmina about four and a half times as long as the pronotum, in greatest width about equal to the length of the latter; costal margin very gently arcuate proximad, tapering distad; apex rounded, sutural margin straight; tympanum of male hardly wider than the disk of the pronotum caudad, veins not strong; radial vein furcate, the ramus reaching the sutural margin immediately proximad of the apex. Cephalic and median limbs slender, the cephalic femora more robust than the median, the genicular margin of the four cephalic femora provided dorsad with a trigonal dentiform process; cephalic tibiae with the auditory foramina cochate, median tibiae slightly expanded proximad. Caudal femora slightly longer ( $\text{\textcircled{f}}$ ) or slightly shorter ( $\text{\textcircled{m}}$ ) than the tegmina, the proximal half moderately bullate, this condition being almost entirely dorsad, genicular lobes with peg-

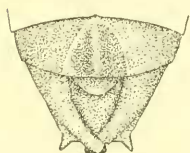


Fig. 12.—*Hormilia apachen* n. sp. Dorsal view of apex of male abdomen. ( $\times 8$ ).

like processes; caudal tibiae slightly longer than the femora. Distal dorsal segment of male with the median section with a rounded slightly depressed area; supra-anal plate small, trigonal; cerci rather short, slightly curved, distal section somewhat flattened, the apex acute and sharply bent dorsad; subgenital plate short, the apical margin truncate and laterad with two short style-like processes. Ovipositor longer than the pronotum, broad, very sharply bent at the base, very slightly tapering distad, the bent portion of the dorsal margin and the distal third of the ventral margin finely serrate. Subgenital plate acute trigonal.

General color chromium green, paler ventrad and on the limbs; antennae with about seven irregularly disposed dark brown annuli on the distal third; pronotum faintly lined with yellowish on the angles; eyes mottled drab and ecru drab.

#### Measurements.

	$\text{\textcircled{m}}$	$\text{\textcircled{f}}$
Length of body, . . . . .	17 mm.	16.5 mm.
Length of pronotum, . . . . .	4.8 "	5 "
Caudal width of disk of pronotum, . . . . .	3 "	3 "
Length of tegmen, . . . . .	25 "	23.5 "
Length of caudal femur, . . . . .	22 "	23.5 "
Length of ovipositor, . . . . .		5.8 "

In addition to the types a male from Palmerlee (Schaeffer) has also been examined.

*Arethæa sellata* n. sp.

Type: ♂; Palmerlee, Cochise Co., Arizona, July 30, 1905 (C. Schaeffer). [Brooklyn Inst. Arts and Sci.]

Allied to *A. constricta* Bruner, but differing in the strongly sellate pronotum, the shorter and comparatively broader head, the broader tympanal field with its strongly bisinuate margin, the slightly longer cephalic femora and slightly shorter median femora, and also in the form of the cerci which have a very slightly dorsal curve at the tips.

Size medium; form very elongate. Head with the mouth cephalad; occiput gently descending to the compressed, slightly elevated and



Fig. 13. — *Arethæa sellata* n. sp. Dorsal view of pronotum and tympanal area of male. (× 4.)

distinctly sulcate fastigium, which, however, is low ventro-cephalad; facial fastigium trigonal, slightly higher than wide, the borders distinctly marginate; eyes elliptical, quite prominent when viewed dorsad; antennæ elongate, rather heavy in structure for this type of Orthopteron. Pronotum distinctly sellate, the caudal portion (metazona) forming a considerable angle with the prozona, the cephalic margin of which is also slightly elevated when viewed laterad; when viewed dorsad the cephalic margin is very broadly triangular emarginate, caudal margin semi-oval in outline; prozona much more constricted than the metazona, the principal sulcus distinct on the lateral lobes;

humeral sinus moderately deep, placed well dorsad on the caudo-lateral margins, which are oblique ventrad, the true ventral margin being somewhat sinuate, a moderately distinct arcuate transverse depression extends from one humeral sinus to the other, wholly independent of the depression of the principal sulcus. Tegmina about four-fifths the length of the caudal femora, narrow, costal field roundly expanded proximad, the costal margin evenly arcuate distad, the sutural margin straight, the apex closer to the sutural margin than to the costal and narrowly rounded; tympanum of medium size, the sutural margin strongly bisinuate, the proximal lobe slightly acute-angulate with the apex rounded; lateral margins of the tympanum slightly arcuate; radial vein with three rami all of which reach the sutural margin. Wings exceeding the tegmina, when in repose, by

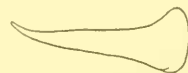


Fig. 14. — *Arethæa sellata* n. sp. Single male cercus. (× 15.)

nearly the length of the median femora. Limbs very slender. Cephalic femora slightly more than twice the length of the pronotum, the tibiae distinctly but not greatly exceeding the femora. Median femora about two-thirds the length of the tegmina, the tibiae exceeding the femora by about the same distance as in the cephalic limbs. Caudal femora about three times as long as the head and pronotum together, the inflation about limited to the proximal two-fifths; tibiae distinctly exceeding the femora in length, all margins spined, the dorsal more strongly so than the ventral. Abdomen subteetate; terminal dorsal segment truncate; cerci tapering, comparatively stout in the proximal half, the apex sharp and rather strongly curved; subgenital plate produced, the apex narrowed and arcuate-emarginate, supplied laterad with distinct, rather sharp styliform processes of moderate length.

General color pale apple green, rather whitish ventrad. Head with the eyes prout's brown; antennae beyond the proximal joint yellowish; narrow postocular stripe indian purple, flanked ventrad with a greenish-white line of equal width. Pronotum with the prozona bearing two converging greenish-white lines, between which the disk is punctate with purplish, the metazona margined with greenish-white and bordered internally with a purplish line, the white margin very broad on the lateral lobes. Tympanum of the tegmina purplish-brown, the veins yellowish as well as the sinuate margin; sutural margin washed with purplish-brown. Abdomen with an arcuate lateral greenish-white line distinctly margined with purple ventrad, the dorsum of the abdomen uniform punctate with the same color; extreme apex of the cerci blackish. Limbs faintly washed with purplish-red.

#### Measurements.

Length of body, . . . . .	16	mm.
Length of pronotum, . . . . .	4	"
Greatest width of pronotum, . . . . .	3.5	"
Length of tegmen, . . . . .	20.5	"
Greatest width of tegmen, . . . . .	2.8	"
Greatest width of tympanum, . . . . .	2.7	"
Length of wing beyond closed tegmen, . . . . .	11.8	"
Length of cephalic femur, . . . . .	9.5	"
Length of median femur, . . . . .	12.5	"
Length of caudal femur, . . . . .	25	"
Length of caudal tibia, . . . . .	27	"

The type is the only specimen of this interesting species examined by the author.

The five species of the genus *Arcthaa* which have been examined by

the author may be separated by the following key,<sup>22</sup> which is based in part on that given by Brunner.

- 1.—Tegmina and wings distinctly shorter than the body,  
*carita* Scudder.
- 1.1.—Tegmina and wings very much longer than the body.
- 2.—Tympanal field of the male tegmen roundly produced.  
Cephalic and median femora with the dorsal apex dentate.
- 3.—Radial vein with three or four rami. Size small,  
*gracilipes* (Thomas).
- 3.3.—Radial vein with five or six rami. Size large,  
*phalangium* (Scudder).
- 2.2.—Tympanal field of the male tegmen angularly produced at  
the transverse vein. Cephalic and median femora with  
the dorsal apex obtuse.
- 3.—Tympanal field of the male tegmen but little expanded,  
the margin being moderately bisinuate. Pronotum  
moderately sellate. Cerci with the tips strongly  
recurved dorsad, . . . . . *constricta* Brunner.
- 3.3.—Tympanal field of the male tegmen moderately ex-  
panded, the margin being strongly bisinuate. Pro-  
notum strongly sellate. Cerci with a very slight  
dorsal inclination at the tips, . . . . . *sclata* Rehn.

**Scudderia mexicana** (Saussure).

Carr Canyon, Huachuca Mountains, September 27, October 8, 16-17, 1905 (Biederman), 2 ♂, 4 ♀.

The species has previously been recorded from this region by Caudell.

**Scudderia furcifera** Scudder.

Carr Canyon, Huachuca Mountains, August (Skinner), 1 ♂, 2 ♀. September 24, October 3, 8 and 20, 1905 (Biederman), 3 ♂, 6 ♀. Palmerlee, July 26, 1905 (Schaeffer), 1 ♀.

In the United States, Scudder recorded this species from Prescott, Arizona, and Scudder and Cockerell from the Organ Mountains, New Mexico.

**Microcentrum laurifolium** (Linnaeus).

Carr Canyon, Huachuca Mountains, October 2, 3 and 8, 1905 (Biederman), 3 ♀.

One of these specimens belongs to the variety *b* mentioned by Saussure and Zehntner.

<sup>22</sup> *A. brevicauda* (Scudder) is not included as it is unknown to the author, and its relationship is probably with *carita*. The same author's *A. consuetipes* has not been seen, and from the description would appear to have a unique position on account of its short legs.



*Microcentrum retinerve* (Burmeister).

Palmerlee, August (Schaeffer), 1 ♀.

This species has been recorded from Nogales, Arizona, by Caudell.

*Conocephalus fuscostriatus* Redtenbacher.

Carr Canyon, Huachuca Mountains, September 28 or 29, 1905 (Biederman), 1 ♂.

This specimen is inseparable from two males of this species from Thomasville, Georgia. This is the first record of the species west of Texas.

*Xiphidion fasciatum* (DeGeer).

Douglas, August (F. H. Snow), 1 ♂, 1 ♀.

*Capnobotes fuliginosus* (Thomas).

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂.

This specimen is distinctly larger than a male from Jerome, Arizona, fully equalling a female from the latter locality.

*Eremopedes unicolor* Scudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 5 ♂, 8 ♀. September 21, 24 and 28, 1905 (Biederman), 2 ♂, 4 ♀. Douglas, August, 1905 (F. H. Snow), 1 ♀.

The Carr Canyon series presents a very considerable amount of individual variation in size. The Douglas female is extremely large, the caudal femora particularly far exceeding the original measurements. However, aside from the very slightly narrower ovipositor, no other characters to separate it are apparent, and as the measurements of this specimen may be of interest they are given herewith.

Length of body (exclusive of ovipositor), . . . . .	27.5 mm.
Length of pronotum, . . . . .	8.9 "
Length of caudal femur, . . . . .	28.5 "
Length of ovipositor, . . . . .	20 "

*Stenopelmatus oculatus* Scudder.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♀. Huachuca Mountains, July 23, 1905 (Schaeffer), 1 ♂.

While one of these specimens appears to approach *californicus* in the small size of the apical spine of the internal margin of the caudal femora, yet, in view of the unreliability of spine formulæ and proportions in this genus, it appears best to place it where all other characters seem to place it—in Scudder's *oculatus*.

*Ceuthophilus paucispinosus* Rehn.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 3 ♂, 4 ♀. September 22, 23 and 28, October 8, 1905 (Biederman), 4 ♂. Palmerlee, August, 1905 (Schaeffer), 1 ♀.

The very interesting series of this species contained in the collections available for study presents several facts in elaboration of the original description of this species, based on a single female from southern Arizona. One is that considerable size variation is present in both sexes, but more particularly in the male. Another is that in the male the ventral ridge of the caudal femora is more elevated and distinctly dentato-serrate (often strongly so), while in several of the specimens of the same sex the proximal fourth of the caudal tibiæ are strongly valgate, beyond which they are straight.

Measurements are here given of the maximum specimens of both sexes.

	♂	♀
Length of body, . . . . .	20 mm.	18.5 mm.
Length of pronotum, . . . . .	5.5 "	5 "
Length of cephalic femur, . . . . .	8.5 "	7.8 "
Length of caudal femur, . . . . .	17 "	15 "
Length of ovipositor, . . . . .	11.2 "	

#### GRYLLIDÆ.

##### *Ellipes minuta* (Scudder).

Douglas, August (F. H. Snow), 1 specimen.

##### *Nemobius neomexicanus* Scudder.

Douglas, August (F. H. Snow), 1 ♀.

This species has previously been recorded from Florence, Arizona.

##### *Gryllus personatus* Uhler.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♂, 4 ♀. Palmerlee (Schaeffer), 1 ♀. San Bernardino Ranch, 3,750 feet, August, 1905 (F. H. Snow), 3 ♂, 3 ♀.

This series has been compared with a representation from Florence, Flagstaff and Phoenix, Arizona. There is considerable variation in the depth of the fuscous coloration and also in size, the latter being as individual as color variation, the largest male and the smallest females being from the same locality (San Bernardino Ranch). All the specimens are of the macropterous type.

##### *Gryllus armatus* Scudder.

San Bernardino Ranch, 3,750 feet, August, 1905 (F. H. Snow), 1 ♂, 1 ♀.

This species has also been examined from Florence and Phoenix, Arizona.

##### *Gryllus alogus* Rehn.

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 2 ♀.

When compared with the type, from Albuquerque, New Mexico,

these individuals are inseparable although both slightly smaller. An additional female from Carr Canyon is placed under this species with a query, agreeing in spine formulæ with *integer* and *pennsylvanicus*, but in general appearance and form similar to *alogus*. The positive determination of species of this genus will probably be impossible until extensive breeding experiments and careful quantitative studies of our "species" have been made.

***Ecanthus niveus* (DeGeer).**

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 1 ♂, 2 ♀. Palmerlee (Schaeffer), 1 ♀.

***Ecanthus nigricornis* Walker.**

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 3 ♀. September 30, 1905 (Biederman), 1 ♀. Palmerlee (Schaeffer), 2 ♀.

These specimens are inseparable from a Monte Redondo, Costa Rica, female.

Caudell has recorded this species from the Huachucas.

***Ecanthus argentinus* Saussure.**

Carr Canyon, Huachuca Mountains, August, 1905 (Skinner), 3 ♂, 2 ♀. October 16-17, 1905 (Biederman), 1 ♂.

These specimens are assigned to this species with some little doubt, as they agree fairly well with the original description of Saussure, but do not tally so closely with the later one given by the same author.<sup>23</sup> The antennal markings are similar to those originally described, but have no supplementary spot or cloud on the first proximal joint as later stated. In other characters these individuals agree very fully with the 1897 description. The remarks made by Caudell<sup>24</sup> regarding Oracle and Hot Springs, Arizona specimens referred to this species are substantiated by the material before me.

## II. PIMA COUNTY.

The specimens here treated were collected by Prof. F. H. Snow, of the University of Kansas, during the summer of 1906. The localities represented are the Baboquivari Mountains and Tucson. The material from the former locality is of very considerable interest as it has been seldom visited and, as far as the author is aware, this series is the first collection of Orthoptera made in that isolated locality.

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<sup>23</sup> *Biol. Cent.-Amer.*, Orth., I, p. 254.

<sup>24</sup> *Proc. Ent. Soc. Wash.*, V, p. 166.

Two species previously known only from localities south of the United States are here recorded from north of the boundary line, while two are described as new.

### MANTIDÆ.

#### *Stagmomantis gracilipes* n. sp.

Type: ♂; Baboquivari Mountains, Pima County, Arizona, 1906 (F. H. Snow). [Coll. University of Kansas.]

Allied to *S. venusta*, *heterogamia*, *montana* and *androgyna* Saussure and Zehntner and *limbata* Hahn. From *venusta*, *limbata* and *androgyna* it can be immediately separated by the slenderer pronotum and limbs, particularly the cephalic femora; from *heterogamia* it can be separated by the much greater size, narrower supra-coxal expansion of the pronotum and the comparatively longer limbs; from *montana* it differs in the smaller size, except the length of the cephalic femora which is about the same in both forms, in the narrower costal margin of the tegmina and in the wings being strongly marked and not vitreous.

Size medium; form slender. Head broad, the depth but little more than half the width. Pronotum slender, the greatest width contained nearly six times in the length; cephalic margin rounded, the collar with parallel sides, the expansion slight, shaft compressed but slightly expanding caudad, margins of the collar slightly crenulate, shaft distinctly carinate. Tegmina slightly more than twice the length of the pronotum; costal field moderately expanded proximad, not appreciable in the distal third, coriaceous; stigma linear, longitudinal, not sharply marked. Wings not exceeding the tips of the tegmina when in repose. Cephalic limbs quite slender, coxæ slightly less than two-thirds the length of the pronotum, distinctly but not strongly spined on the cephalic margin with two grades of spines, caudal face with the surface rugose owing to the presence of short spiniform tubercles, between which the surface is uneven; cephalic femora very slightly shorter than the pronotal shaft, the principal discoidal spine being situated very near the middle, lateral margins armed with five spines, one of which is small and genicular in position, internal margins armed with fourteen to fifteen spines, one small and genicular and the remainder divided

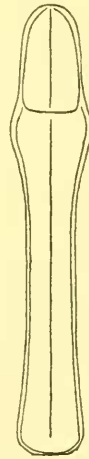


Fig. 15.—*Stagmomantis gracilipes* n. sp. Dorsal view of pronotum of type. ( $\times 3$ .)

into two alternating series, discoidal spines four in number; cephalic tibiae slightly more than half the length of the femora, external margins armed with eight to ten spines which leave unarmed a considerable proximal area, internal margins with a regularly enlarging series of eleven to twelve spines; cephalic tarsi somewhat longer than the tibiae without apical claw, the metatarsi alone but little shorter than the tibiae. Median and caudal limbs very slender, the caudal femora about five-sixths the length of the pronotum.

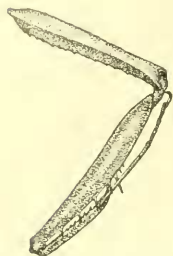


Fig. 16. — *Stagmomantis gracilipes* n. sp. Cephalic limb of type. ( $\times 2$ .)

General color ochraceous, the head inclined toward ochraceous-rufous, the ventral surface of the thorax and abdomen chrome yellow, the median and caudal femora deepening to blackish brown proximad. Tegmina brownish hyaline, the costal field opaque, probably green in life, the costal and discoidal fields separated by a wash of russet which fades rapidly on the discoidal side. Wings with the costal margin marked with russet, the remainder with subquadrate patches of seal brown such as are frequently found in the genus.

#### Measurements.

Length of body (approximately <sup>25</sup> ),	58 mm.
Length of pronotum,	19.5 "
Greatest width of the pronotum,	3.3 "
Length of tegmen,	40.5 "
Width of proximal portion of costal field,	1.8 "
Length of cephalic femur,	13.1 "
Length of cephalic tibia (exclusive of apical claw),	6.2 "
Length of median femur,	13 "
Length of cephalic femur,	16.5 "

The type is the only specimen of this interesting species which has come to the author's attention.

#### *Vates paraensis* Saussure.

Baboquivari Mountains, 1 ♀.

This specimen has been compared with an undoubted Guadalajara female of this species and is inseparable from it. In size it is slightly larger, but well within the measurements given by Saussure and Zehntner. The species described by the author as *V. townsendi* can readily be separated from *paraensis* by the more compressed pronotal shaft,

<sup>25</sup> The distal section of the abdomen is missing.

the more expanded and sublamellate supra-coxal expansions of the same, the more strongly lobed limbs and abdomen and the distinctly emarginate marginal field of the tegmina. The Arizona specimens of *Vates* recorded by Caudell as *V. townsendi*<sup>26</sup> may probably be this species and not *townsendi*, which has stronger pronotal expansions in the female than we would suppose were possessed by the female of the species figured.

The only previous records of this species north of Panama were from Guadalajara, Jalisco, and Cuernavaca, Morelos, Mexico.

#### ACRIDIDÆ.

***Telmatettix aztecus* (Saussure).**

Tucson, 1 ♀. Baboquivari Mountains, 2 ♂, 3 ♀.

These specimens have been compared with Yautepec, Morelos, and Teocelo, Vera Cruz individuals.

***Clypeotettix schochii* (Bolivar).**

Baboquivari Mountains, 1 ♀.

This specimen is inseparable from Morelos and Vera Cruz specimens, and constitutes the first record for the species from the United States.

***Paratettix toltecus* (Saussure).**

Tucson, 3 ♂.

Specimens from Arizona, New Mexico, Mexico, Nicaragua and Costa Rica have been used for comparison.

***Achurum acridodes* (Stål).<sup>27</sup>**

Baboquivari Mountains, 1 ♂.

***Mermiria neomexicana* (Thomas).**

Baboquivari Mountains, 1 ♂.

This is the first Arizona record of the species, which ranges south as far as the State of Durango.

***Cordillacris pima* n. sp.**

Type: ♀; Baboquivari Mountains, Pima Co., Arizona. 1906. (F. H. Snow). [Coll. Univ. of Kansas.]

In many respects this species appears to connect the two types previously known in the genus, *i.e.*, *occipitalis* and *crenulata*. From the former type (*occipitalis*, *cinerea* and *affinis*) it can be separated by the more strongly bowed lateral carinæ of the pronotum, narrower tegmina and the distinctly slenderer caudal limbs. From *crenulata* the new form can readily be distinguished by the larger size, the slenderer and less inflated head, more retreating face, narrower tegmina and longer limbs.

<sup>26</sup> *Journ. N. Y. Ent. Soc.*, XIII, p. 83, Pl. III, figs. 1, 2.

<sup>27</sup> For the definition of *acridodes* see *antea*, p. 31.



Size medium; form quite elongate. Head broad caudad, regularly narrowed cephalad; occiput and vertex distinctly ascending above the level of the pronotum, the interspace between the eyes no narrower

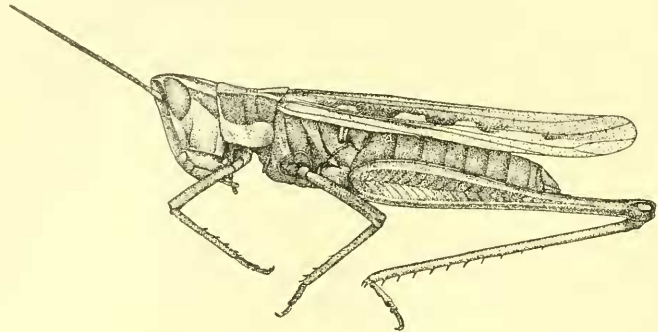


Fig. 17.—*Cordillacris pima* n. sp. Lateral view of type. ( $\times 3$ .)

than the fastigium, the latter obtuse-angulate with the margins sharp and bordered immediately caudad by a very narrow depressed space; angle of the fastigium viewed laterad very slightly acute-angulate, the immediate angle rounded, face very considerably retreating; frontal costa very narrow dorsad, regularly expanding ventrad, the portion dorsad of the ocellus decidedly sulcate, the portion ventrad of the ocellus slightly sulcate, the margins somewhat cariniform; eyes slightly longer than the infraocular sulcus; antennæ very considerably longer than the head and pronotum, the proximal portion depressed and subensiform, the extreme apex also being depressed. Pronotum short, the cephalic margin of the disk sinuate with a slight median emargination, caudal margin rotundato-truncate; median carina slightly elevated on the metazona; lateral carinæ slightly constricted caudad on the prozona, strongly flaring on the metazona; prozona slightly longer than the metazona; lateral lobes slightly longer than deep. Tegmina distinctly surpassing the apex of the abdomen, narrow, the apex rounded. Cephalic and median limbs slender; caudal femora quite slender, the greatest width contained about five and a half times in the length, caudal tibiæ very slightly shorter than the femora, armed on the lateral margin with ten spines.



Fig. 18.—*Cordillacris pima* n. sp. Dorsal view of head and pronotum. ( $\times 3$ .)

General colors chalk white and mummy brown, the maculations of

the darker color distributed in the manner usual in this genus. Head with a distinct median bar of brown extending from the fastigium to the caudal section of the occiput where it is broken up, a narrow median line in this maculation and lateral margins of the same are bordered with buff; postocular bar distinct, genæ white, face pale buff; antennæ buffy proximad becoming glaucous green, with a faint touch of buffy on the tips. Pronotum with the dorsum chiefly buffy, the lateral carinæ buff, margined ventrad with a narrow line of black and the broad continuation of the postocular bar; the buff area on the disk of the prozona bears mesad an elongate trigonal faintly whitish area, while the lateral portions of the metazonal disk are distinctly velvety black, ventral portion of the lateral lobes white. Tegmina with the white discoidal maculations crudely hemispherical in shape and four in number, costal area also white, region of the anal vein buffy. Cephalic and median limbs whitish finely punctate with brown; caudal femora with the dorsal section of the lateral face purplish brown, the dorsal face with a small median and an elongate pregenicular blotch of the same color; caudal tibiæ lavender, very pale proximad, the spines pale buff tipped with black.

*Measurements.*

Length of body, . . . . .	19.5 mm.
Length of pronotum, . . . . .	3 "
Length of tegmen, . . . . .	15.2 "
Length of caudal femur, . . . . .	13.5 "

The type is the only specimen seen.

*Scyllina calida* (Bruner).

Baboquivari Mountains, 1 ♀.

This is the second record for the species from the United States.

*Psoloessa maculipennis* Scudder.

Baboquivari Mountains, 4 ♀.

One of these specimens is suffused with blackish dorsad, while another, which otherwise is of the normal type of coloration, has the femoral markings very small.

*Psoloessa texana* Scudder.

Baboquivari Mountains, 2 ♂, 2 ♀.

One of the male specimens of this species has a prominent longitudinal dorsal line of ochraceous flanked laterad by purplish brown, the latter color continuous from the vertex to the tegmina, which it almost entirely suffuses.

*Psoloessa buddiana* Bruner.

Baboquivari Mountains, 2 ♀.

*Ageneotettix australis* Bruner.

Baboquivari Mountains, 4 ♂, 1 ♀.

This species is now known from Maricopa, Cochise and Pima Counties.

*Aulocara rufum* Scudder.

Baboquivari Mountains, 1 ♂.

This is the second record of the species from Arizona; the nearest points from which the species has previously been recorded being San Bernardino Ranch, Cochise Co., Arizona, and La Cueva, Organ Mountains, New Mexico.

*Arphia aberrans* Bruner.

Baboquivari Mountains, 1 ♀.

This species is only known from the Mexican border of Arizona, *i.e.*, Nogales and the Huachuca Mountains.

*Encoptolophus texensis* Bruner.

Tucson, 1 ♂, 2 ♀.

*Laotista osleri* Caudell.

Tucson, 1 ♀.

The previously known localities for this species are Nogales, Arizona, and Albuquerque, New Mexico.

*Tomonotus ferruginosus* Bruner.

Baboquivari Mountains, 2 ♂, 1 ♀.

One of the male individuals possesses a very peculiar coloration.

*Tomonotus aztecus* (Saussure).

Baboquivari Mountains, 1 ♀.

This individual agrees with a specimen mentioned by the author on a preceding page<sup>23</sup> in having the frontal costa hardly constricted ventrad of the ocellus.

*Derotmema delicatulum* Scudder.

Baboquivari Mountains, 1 ♂, 1 ♀.

The previous Arizona records of this species are from between Gila Bend and Yuma and Florence.

*Mestobregma rubripenne* (Bruner).

Baboquivari Mountains, 1 ♂, 1 ♀.

The shorter and more robust caudal femora of this species immediately separates it from *M. plattei*, its nearest ally.

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<sup>23</sup> P. 38.

*Conozoa carinata* Rehn.

Baboquivari Mountains, 2 ♂, 1 ♀.

These specimens fully agree with the typical series from the Huachuca Mountains, Cochise Co., Arizona.

*Trimerotropis fasciula* McNeill.

Baboquivari Mountains, 1 ♂.

In coloration this specimen is slightly paler than Huachuca Mountains representatives, with the internal and ventral faces of the caudal femora suffused with the same red color as the tibiae, while the dorsum of the abdomen has a wash of the same color. The general size is slightly larger than Huachuca specimens and the proportionate length of the tegmina is about the same, much longer proportionately than in the type individuals.

*Heliastus aridus* (Bruner).

Tucson, 1 ♀.

*Heliastus benjamini* Caudell.

Baboquivari Mountains, 1 ♂, 1 ♀.

The previous localities for this species are Nogales and the Huachuca Mountains, Arizona. The male is more ferruginous than any other specimen examined by the author.

*Schistocerca vaga* (Scudder).

Tucson, 1 ♂.

This individual is small and rather paler than the majority of specimens of this species. The amount of color variation presented by individuals of this form is very considerable, the extremes having quite different appearances but being connected in any series by members of intermediate specimens.

*Conalocæ huachuana* Rehn.

Baboquivari Mountains, 1 ♀.

This specimen is inseparable from the female type, and is the first record of the species beyond the limits of the Huachuca Mountains.

*Hesperotettix festivus* Scudder.

Tucson, 1 ♀.

This individual has the pregenicular annuli very distinct, but shows no traces of the blackish pencilling of the pronotal sulci seen in *H. viridis*.

*Melanoplus brownii* Caudell.

Baboquivari Mountains, 1 ♀.

This specimen appears to belong to this species which was described from near Yuma, Arizona. Coloration counts for very little in *M.*

*flavidus* and its allies, and little stress should be laid on its determinative value. In measurements this individual differs from the original only in that the caudal femora are one millimeter shorter than the minimum there given.

#### TETTIGONIDÆ.

*Arethæa constricta* Bruner.

Tucson, 1 ♀.

This specimen is inseparable from Texas females of this species, and constitutes the first record from west of the Organ Mountains, southern New Mexico.

*Scudderia mexicana* (Saussure).

Baboquivari Mountains, 1 ♂.

*Eremopedes unicolor* Scudder.

Baboquivari Mountains, 1 ♂.

Huachuca Mountains specimens are usually smaller than this individual, which is very pale and buffy-brown in color.

*Atelopplus notatus* Scudder.

Tucson, 1 ♀. Baboquivari Mountains, 1 immature ♀.

These representatives have been compared with a female from Florence, Arizona, and show no differences except a more blackish coloration.

*Gryllus armatus* Scudder.

Tucson, 1 ♀.

*Miogryllus lineatus* (Scudder).

Tucson, 1 ♀.

This record is of very considerable interest, as no mature specimens of this species have been recorded since the types were collected along the Colorado River between Mohave City and the Virgin River.

*Eoanthus californicus* Saussure?

Baboquivari Mountains, 2 ♀.

These specimens are assigned here with some little doubt, as they have distinct blackish lines on the two proximal antennal joints. However, in the shape of the femora, the color of the head and the antennæ, aside from the markings, they agree with males of this species, while the pronotum has the sulci disposed in a similar fashion and differs only in the lack of caudal expansion, a character which appears to be sexual in this genus, due to the greater expanse of the male tegmina. Some little affinity is shown with the recently described *E. rehnii* Baker, but the specimens are clearly distinct from that

species, while the heavier caudal femora immediately separate it from *argentinus*.

### III. PHOENIX, MARICOPA COUNTY.

The specimens considered in this portion of the paper were collected by Dr. R. E. Kunzé, and are now in the Hebard Collection.

A few specimens from Prescott have also been included, but where no locality is mentioned Phoenix is understood. A striking new species of *Ceuthophilus* is here described.

#### BLATTIDÆ.

*Blatta orientalis* Linnaeus.

Prescott, July 14, 1904. 1 ♂, 1 ♀.

*Homœogamia erratica* Rehn.

September 17 and October 9, 1903; September 14, October 2, 5 and 7, 1904. 7 ♂.

These specimens represent the pale typical and the slightly infusate form.

*Homœogamia apache* Saussure.

April 9, 1902; June 7 and 9, 1904. 3 ♂. Prescott, July 14 and 18, 1904. 3 ♂.

The Phoenix specimens represent the typical form of the species, while the three Prescott individuals are of the very strongly infusate form called *infusata* by Caudell<sup>29</sup> on the basis of a Phoenix specimen. The interspaces between the eyes and between the ocelli in these specimens and in those of *erratica* agree in relative proportions with the material previously studied by the author.<sup>30</sup>

#### MANTIDÆ.

*Litaneutria minor* (Scudder).

June 16, August 21, September 11, 17 and 24, October 1, 2, 11 and 24, December 1, 1904. 5 ♂, 5 ♀.

*Stagmomantis limbata* (Hahn).

September 10, 1901; August 21 and September 29, 1904. 2 ♂, 1 ♀.

One of these males is much smaller than the other. The female is referred here with a little uncertainty, as it is similar to the one from San Bernardino Ranch, Cochise Co., Arizona, mentioned in this paper.<sup>31</sup> The costal field of the tegmina is no wider than in that

<sup>29</sup> *Proc. U. S. Nat. Mus.*, XXVIII, p. 463.

<sup>30</sup> *Proc. Acad. Nat. Sci. Phila.*, 1903, pp. 181, 187-189; *Ent. News*, 1903, p. 327. †

<sup>31</sup> *Antea*, p. 28.



specimen, the form is smaller than in the average of *limbata*, while the pronotum is distinctly though slightly constricted cephalad of the supra-coxal expansion. The wings are purplish black caudad while the tegmina are green. The left cephalic femur, tibia and tarsus of this specimen have been regenerated; the femur being slightly smaller than the right but otherwise normal, the tibia is a short rounded joint not a third the femoral length with the margins unarmed, while the tarsus is quite short.

#### PHASMIDÆ.

*Diapheromera arizonensis* Caudell.

September 7, 8 and 15, October 17 and 20, 1904, 21 ♀.

As the female of this species has not been well described, some notes may prove of service.

When compared with a female of *D. femorata* from Philadelphia, *arizonensis* is seen to be somewhat more robust, the head is distinctly broader and the eye larger, while the proximal joint of the antennæ is narrower. The median segment is slightly more transverse than in *femorata*, and the cerci are much shorter and blunter, while the three distal abdominal segments are distinctly shorter and the subgenital opercule is provided with a distinct apical finger-like lobe. Limbs slightly longer than in *femorata* with the femoral spines distinct. When compared with the closely allied Mexican *D. calcarata*, the female of *arizonensis* is seen to be somewhat slenderer, but with a broader head. The structure of the abdominal appendages and the terminal segments is the same as in *calcarata*, but the limbs of the latter species are distinctly more robust.

#### ACRIDIDÆ.

*Orphulella graminea* Bruner.

September 30, October 4-5. 14 ♂, 14 ♀.

These specimens agree with four paratypic specimens, two of each sex, received from Prof. Bruner. In size the majority of the female individuals are somewhat larger than the paratypic specimens, but no larger than the original measurements. In color some are distinctly mummy brown, others vinaceous-cinnamon and russet. The discoidal area of the tegmina is quite distinctly marked with quadrate blotches in about half of the specimens.

*Encoptolophus texensis* Bruner.

September 24. 1 ♀.

This specimen has the head, pronotum, pleura and dorsal aspects of the caudal femora suffused with pale green.

*Conozoa behrensi* Saussure.

September 18. 1 ♀.

*Trimerotropis vinculata* Scudder.

October 17. 6 ♂, 12 ♀.

*Anconia integra* Scudder.

September 24, October 11-18. 10 ♀.

This series presents all color variations, from the nearly uniform green type to a strongly maculate form with the pronotal markings very decided.

*Schistocerca vaga* (Scudder).

October 10-16. 4 ♂, 5 ♀.

These specimens vary considerably in coloration, several females having the dorsum of the pronotum almost unicolorous, while the variation in the intensity of tegminal maculations is very considerable.

*Schistocerca shoshone* (Thomas).

September 25 to December 15. 5 ♂, 9 ♀.

Considerable variation is exhibited by this series in the coloration of the caudal tibiae, shades ranging from pale purplish pink to decided purplish red being present on those parts.

*Hesperotettix festivus* Scudder.

October 31, November 1-28, 1903. 4 ♂, 6 ♀.

*Melanoplus herbaceus* Bruner.

November 24 and 26, 1903. 12 ♂, 8 ♀.

These specimens are practically intermediate between true *herbaceus* and *flavescens* Scudder, which cannot be considered as other than a western race of *herbaceus*. In color and genital characters this series is truly intermediate, and in the author's opinion we must use the trinomial *M. herbaceus flavescens* for Scudder's form.

*Melanoplus pictus* Scudder.

November 18-28, 1903; October 10, 1904. 10 ♂, 10 ♀.

This series is clearly referable to this species which was described from Bradshaw Mountain, Yavapai-Maricopa Cos., Arizona. When compared with the original description, the only difference which appears is that the caudal tibiae are "purplish fuscous" or near it in but one specimen, the others ranging from pale glaucous to rather bright blue. There is a certain amount of variation in the actual presence or the intensity of the yellowish line along the lateral angles of the prozona, and in structure there is an appreciable variation in the width of the interspace between the mesosternal lobes, the latter being subcontiguous in one male individual.

*Melanoplus atlanis* (Riley).

November 18-24, 1903. 7 ♂, 3 ♀.

These specimens are quite large when compared with Eastern specimens, a fact which is true of Florence, Arizona, individuals.

*Melanoplus differentialis* (Thomas).

September 4, October 16, 1904. 5 ♂, 1 ♀.

#### TETTIGONIDÆ.

*Hormilia elegans* Scudder.

September 5-7, 1904. 2 ♂, 6 ♀.

Three of the females present the type of coloration which has the dark areas of the tegmina large and deep in color, surrounding and isolating the light greenish portions. In this type the pronotum is richer in color, owing to the more definite whitish margins contrasted with the broad dark area which is placed on the caudal section of the pronotal disk, and also in the patch on the lateral lobes being larger and more conspicuous. One specimen is extremely pale, the dark markings being weak or mere suggestions of color.

*Microcentrum laurifolium* (Linnæus).

November 24 and 26, December 1, 1903. 1 ♂, 4 ♀.

*Stenopelmatus oculatus* Scudder.

Prescott, Arizona, July 14, 1904. Phoenix, September 16, 1903. 2 ♂.

*Ceuthophilus lamellipes* n. sp.

Types: ♂ and ♀; Phoenix, Maricopa Co., Arizona, November 18, 1903. (Kunzé.) [Hebard Collection.]

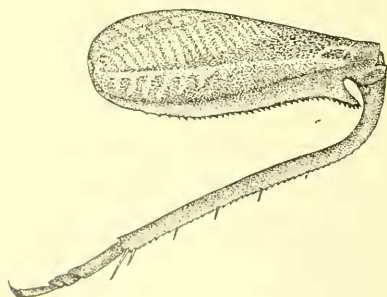


Fig. 19.—*Ceuthophilus lamellipes* n. sp.  
Caudal leg of male. (× 3.)

Allied to *C. pacificus*, *henshawi* and *salebrosus* Scudder, but in most every character closer to *salebrosus*<sup>32</sup> than to the others. From this it differs in the nearly smooth abdomen, the greater size, the different proportions of the caudal tarsal joints (second twice as long as the third), the different character of the serrations on the lamellate ventral carinæ of the caudal femora, the longer cau-

<sup>32</sup> *Canad. Entom.*, XXXI, p. 120. [Tenino, Thurston Co., Washington.]

dal tibiae and the presence of an apical hook on the inner valves of the ovipositor.

Size medium; form moderately compressed. Head with the occiput and vertex declivent to the low, broadly trigonal, shallowly sulcate fastigium; eyes trigonal pyriform; distal joint of the palpi arcuate. Pronotum with the cephalic margin slightly emarginate, caudal margin subtruncate; lateral lobes with the ventral margin slightly arcuate. Abdomen smooth; ovipositor very slightly longer than the pronotum, tapering from the base to about the middle, distad of which it is subequal, the apex obliquely truncate, the inner valves each armed with five teeth, of which the two terminal ones are longer than the others and more recurved; styles of the female about equal to the ovipositor in length. Cephalic femora about a third again as long as the pronotum, moderately robust, the cephalic margin armed with a single pregenicular spine; cephalic tibiae equal to the femora in length. Median femora in the male half again as long as the pronotum, in the female slightly less, the cephalic margin armed with three or four spines of which the distal is the longer, caudal genicular lobe spined. Caudal femora in the male moderately long, very considerably inflated, the greatest width contained about two and a half times in the length, dorsal face well supplied with sharp tubercles on the tracings of the scalariform pattern and other irregular lines, ventral carinae elevated, distinctly lamellate, the margins serrato-dentate, separated from the genicular region by a narrow area where the lamellate ridges are roundly excised, immediately proximad of this the ridge develops an acute trigonal process, the ventral margin of which is serrato-dentate continuous with the proximal portions of the carinae; ventral sulcus very broad and moderately deep, the trigonal processes of the margins diverging; caudal tibiae of the male in actual length (following curve) longer than the femora, the proximal fourth forming a quarter circle, the distal three-fourths straight, four pairs of spurs present on the dorsal margins of the shaft, in length these hardly equal the tibial depth, the margins also well supplied with fine teeth, ventral margin somewhat crenulate proximad and with a single spine immediately proximad of the two apical ones, apical spurs long, the median internal one about equalling the dorsal length of the metatarsus; caudal tarsi with the third joint not more than half the length of the second. Caudal femora of female moderately inflated, the greatest width contained about three

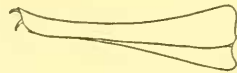


Fig. 20.—*Ceuthophilus lamellipes* n. sp. Lateral view of ovipositor. ( $\times 6$ .)

times in the length, dorsal surface with a few sharp tubercles, but the number or size not as great as in the male, ventral carinae slightly elevated, finely serrato-dentate in the distal half and with an indication of the pregenicular diastema of the male; caudal tibiae of female straight, slightly longer than in the male.

General color, clay color marked more or less with prout's brown. Antennae cinnamon. Pronotum with a narrow median area and the ventral portions of the lateral lobes of the general color, as well as a large irregularly quadrate or rectangular patch on each side. Mesonotum and metanotum with an irregular system of broad alternating pale and dark bars, the abdomen bearing the type of markings only more numerous, smaller, and more restricted to the caudal margin of the segments. Cephalic and median limbs sometimes clouded with the darker color; caudal femora with the tubercles and serrations dark, in the female the pattern of musculation being more truly scalariform and not with a broad medio-longitudinal interruption as in the male.

#### Measurements.

	♂	♀
Length of body, . . . . .	16.5 mm.	17.5 mm.
Length of pronotum, . . . . .	4.5 "	4.2 "
Length of cephalic femur, . . . . .	6.2 "	5.5 "
Length of median femur, . . . . .	6 "	5.5 "
Length of caudal femur, . . . . .	12.8 "	11.3 "
Length of caudal tibia, . . . . .	13.2 <sup>33</sup> "	11 "
Length of ovipositor, . . . . .		4.5 "

In addition to the types a paratypic male, taken November 7, has also been examined.

#### GRYLLIDÆ.

##### *Gryllus personatus* Uhler.

September 7-12, November 24, 1903. 5 ♂, 18 ♀, 1 nymph (XI. 24).

This interesting series shows that a considerable amount of variation in size exists in this form. While this feature is very apparent it is not as conspicuous as the variation in color, which latter ranges from a decidedly straw-colored type (the predominating phase) to a blackish brown form with no trace of the usual coloration, except a very narrow pale margin to the ventral portion of the lateral lobes and a few small spots on the vertex and fastigium. In many respects this dark type superficially resembles Mexican specimens of *G. assimilis*, from which,

<sup>33</sup> In straight line.

however, it can be separated by the form of the speculum of the male tegmina.

All the adult specimens seen are macropterous.

*Gryllus armatus* Scudder.

September 7-12, 1903. 1 ♂, 11 ♀.

But little variation in size is presented by this series, and in coloration a slight deepening of the shade of the tegmina and on the caudal femora a replacing of tawny by bistre is all that is noteworthy. The base color of the pronotum shows a tendency toward reddish in several specimens, the head, however, remaining shining black. All the specimens are macropterous.

*Gryllus alogus* Rehn.

November 18, 1903. 1 ♀.

*Ecanthus californicus* Saussure.

November 10 and 24, 1903. 2 ♂.